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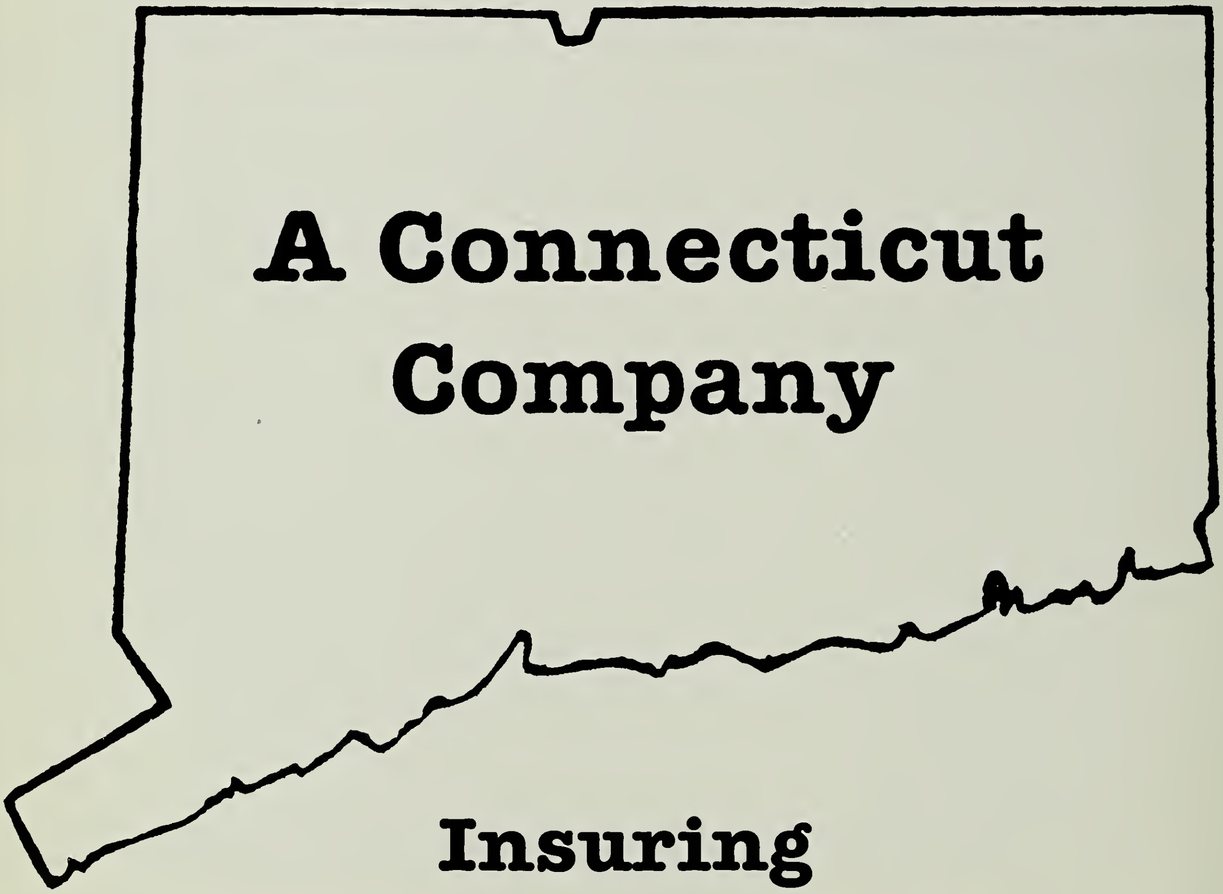

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Connecticut Emergency Department Physicians Survey

Implications for Graduate Medical Education

RICHARD SALLUZZO, M.D., GEORGE TERRANOVA, M.D.,
WILLIAM GEMMELL, M.D., AND DIANE BOLAND

ABSTRACT—A survey conducted in mid-1989 of 36 Connecticut hospital emergency departments sought to determine the nature of physician staffing and the volume and the acuteness of patient problems. Overall, only 31% of emergency department staffing is provided by board certified emergency physicians in the state of Connecticut. In addition to emphasizing the lack of board certified emergency physicians available in the state, this survey also indicated a relative deficiency in emergency department physician staffing in general with approximately 20% of all positions currently unfilled statewide. The implications of these findings for graduate medical education in Connecticut are discussed.

INCREASED attention has been focused in recent years on the qualifications and training of physicians who staff emergency departments. The Joint Commission on Accreditation of Healthcare Organizations and other regulatory agencies are becoming more involved in the credentialing process for emergency department physicians. For instance, the New York State Department of Health regulation 405.19D states:

Effective July 1, 1993, documented work experience will no longer be accepted in lieu of specialty board certification. At that time, emergency service attending physicians must be board certified or admissible in a relevant medical specialty. Board admissible physicians must achieve certification within five years of first becoming board admissible to remain qualified under the new regulations.[1]

The American College of Emergency Physicians has adopted the following position with respect to emergency department physician staffing:

It is ideal for all physicians working in an emergency department to be board certified in emergency medicine. Until that goal is realized, however, the following are recommended qualifications in order of preference for emergency department physicians:

1. Resident training in emergency medicine.
2. Training and experience necessary to take the emergency medicine board certification examination.
3. Residency training in a related specialty.
4. Experience in and full time commitment to emergency medicine.[2]

Nationwide many public health officials are reviewing and proposing new regulations regarding increased supervision of house officers and attending physicians in emergency departments. In addition, consumers increasingly have greater expectations concerning emergency department care. The overall effect of this renewed public and regulatory interest in the training and qualifications of emergency department physicians will be to increase the demand for fully trained and qualified emergency physicians.

Special recognition for the field of emergency medicine was achieved in 1980 with the designation of the American Board of Emergency Medicine (ABEM). ABEM has granted certification to approximately 7,000 physicians since 1980, many of whom are qualified as practice-eligible to take the certification examination. Since July 1988, however, only emergency medicine (EM) residency graduates have been eligible to take the board examination, thus limiting the number of new board certified physicians to approximately 700 per year from emergency medicine training programs nationwide.

Data from a 1984-1985 emergency man power survey revealed that 36% of all physicians working in emergency departments are now board certified in emergency medicine.[3] More than 88% of emergency physicians are United States medical school graduates, compared to 78% for all other specialties.

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Connecticut with its two medical schools and affiliated medical centers plays a significant role in specialty training. Residency training in all major subspecialties is offered except in emergency medicine, where no residency program exists, and consequently in this state not a single emergency department resident is being trained. It is clear, therefore, that medical centers in Connecticut have not developed emergency medicine training programs to the extent that they have those in more established specialties. Since Connecticut is a state in which there are more than one million emergency department visits yearly without an emergency medicine residency program, we chose to evaluate the nature of physician staffing and patient visits in the emergency departments throughout the state to determine the need for the establishment of such a residency program.

Methods

A written survey of 36 hospital emergency departments was conducted in Connecticut during the months of May and June 1989. An attempt was made to contact the emergency department medical director or designee in each instance. The hospitals surveyed represented 100% of the hospital emergency departments in the state. A total of 34 hospitals participated while two hospitals declined to participate in this study. The following questions were posed by the survey in addition to identifying the name and title of person interviewed:

1. What is the total number of annual visits to your emergency department?
2. What percentage of these total visits results in admission to the hospital?
3. Provide the total number of full-time physicians needed to fully staff the emergency department consolidating any part-time positions to make up full-time equivalent positions.
4. What is the average number of hours worked by a full-time physician excluding vacation time?
5. Of the full-time physicians, how many are board certified in emergency medicine?
6. Is the department currently short staffed? If yes, by how many full-time physician equivalents?

Results

The average percentage of physician coverage provided by board certified emergency physicians in Connecticut emergency departments is 31%. The average number of physician full-time equivalents (FTEs) necessary to staff hospital emergency departments in Connecticut is 8.2. The actual number of FTE physicians currently staffing emergency departments in the state is 213. Of this group, 44% or approximately 95 physicians are board certified in emergency medicine. The number of physicians falls 80 short of the number actually needed to fully staff emergency departments in Connecticut. The average number of annual visits to each Connecticut emergency department was 32,000. The average percentage of the patients admitted from the emergency department based on total annual visits was 15%; thus, about one in every seven patients seen in the emergency department in Connecticut is admitted to the hospital. Of those admitted, approximately 33% are admitted to the critical care unit. Each FTE physician provides 40 hours of emergency department coverage each week. On average, each FTE physician sees 90 patients per week, approximately 14 of whom will require admission, with four going directly to critical care units.

Discussion

Hospital emergency departments provide a variety of essential services to the public on a demand basis. Consequently, the staff and physicians must be capable of treating a wide range of illnesses and injuries with efficiency and a high degree of skill. Moreover, no patient can be denied access to care in a emergency department in Connecticut on the basis of inability to pay. The indigent of the state also utilize emergency department services for a significant portion of their medical care. Most hospital emergency department physicians must meet a wide range of medical and social needs of their patients and must have the appropriate background to deal effectively with them. It is clear that the quality of service of an emergency department is a direct reflection of the training of its nursing and physician staff. The results of this survey indicate that not only are Connecticut emergency departments somewhat short staffed, but training qualifications of the emergency physicians currently in practice fall below the national norm.

There are approximately three hundred emergency department staff positions available in the state, only 95 or 31% of which are filled by physicians board-certified in emergency medicine.

Given the fact that board certification by the practice route is no longer possible, it is clear that the demand for additional qualified emergency department physicians will remain largely unmet unless these trained physicians are drawn from other programs and states.

It seems apparent from the results of this survey that the establishment of an emergency department residency is needed in Connecticut to meet current staffing needs as well as to meet the standards of regulatory agencies and the needs of the patients.

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Low Dose Streptokinase for Acute Myocardial Infarction in a Community Hospital

CHANDRA K. SACHETI, M.D., MICHAEL R. SHARON, M.D.,
DIANNE KESSLER, R.N., AND MARTHA OLSON, R.N.

A number of recent studies have demonstrated that acute myocardial infarction is frequently associated with coronary thrombosis[1] and that prompt administration of thrombolytic agents such as streptokinase, urokinase, or tissue plasminogen activator may reestablish flow in the occluded coronary artery.[2-5] A few studies have also suggested that reperfusion may improve left ventricular function and survival during the several months following the acute myocardial infarction.[4-5] Intracoronary streptokinase induces thrombolysis in 70% to 80% of the patients with acute myocardial infarctions,[3-6] but its application in a small community hospital is limited. In the community hospital intavenous streptokinase can be administered quickly and does not require sophisticated and expensive cardiac catheterization facilities. Several recent studies have shown that it is generally safe and well-tolerated, but therapeutic results have been disputed. Gang et al[7] reported lysis in 96% of the patients, but Spann et al[9] reported a lower incidence of thrombolysis of only 50%. Most of the studies reported have been in major medical centers rather than in community hospitals. A high incidence of complications has also been reported when using high-dose intravenous streptokinase. This article reports our experience with low-dose intravenous streptokinase for acute myocardial infarction in a small community hospital.

Patients and Methods

Patients were considered for intravenous streptokinase if they met the following criteria: Less than 70 years of age, electrocardiographic evidence of acute transmural myocardial infarction with ST elevation and reciprocal ST segment depression in at least two leads of the standard 12-lead EKG, both unresolved by 0.3 mg of sublingual nitroglycerin; chest pain of at least 20 minutes duration within the four hours before arrival in the emergency room.

Streptokinase was considered to be contraindicated in patients over 70 years of age, in those with fractured skull, subdural hematoma, or cerebral bleeding; patients who had suffered a stroke within previous two months, or who had concurrent active bleeding or a bleeding diathesis, surgery within two weeks, or any of the contraindications to the use of thrombolytic therapy including recent external cardiac massage, pulmonary edema, cardiogenic shock, and streptokinase administration within the last six months. All patients were requested to sign an informed consent statement to receive intravenous streptokinase. Followup cineangiograms were recommended on all patients to determine artery patency, and coronary angiograms were performed on those patients who consented. Following evaluation of clinical symptoms and laboratory data, the patients were transferred to the intensive care unit. Laboratory tests were obtained, including coagulation and bleeding indices, complete blood count (CBC), partial thromboplastin time (PTT), prothrombin time (PT), platelet count, fibrin split products (FSP), fibrinogen, thrombin time (TT), and blood type and crossmatch for two units of packed cells. Template bleeding time (TBT) was also obtained. Streptokinase 750,000 units in 50 ml of 5% glucose solution was given over a 30-minute period. Electrocardiograms were obtained 15 minutes before infusion, during the infusion, and one-half hour, one hour, and two hours after the infusion. Blood was obtained for determination of creatine phosphokinase (CPK) isoenzymes prior to the infusion and then two and four hours after and every eight hours for the next 24 hours.

Measurements

PTT was performed two hours after the conclusion of the streptokinase infusion. If the PTT was greater than 50 seconds, it was measured hourly until it was 50 seconds or less, at which time a sustained intravenous

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heparin infusion was begun. The PTT was rechecked every six hours for the next 24 hours and then every 12 hours. Repeat PT, platelet count, FSP, fibrinogen, and thrombin time were obtained 24 hours following the streptokinase infusion.

Clinical evidence of reperfusion was evaluated by resolution of symptoms, resolution of the ST segment elevation, or by early peak of the CPK isoenzymes. Twenty of the 23 patients had coronary arteriograms performed within seven to 10 days, thus providing the angiographic data for this retrospective study.

Results

A total of 23 patients (10 women and 13 men) met the criteria to receive intravenous streptokinase. Of those, two male patients refused angiography and one was transferred to a tertiary care facility for an angiogram following persistent chest pain and congestive heart failure. He expired 24 hours after intravenous streptokinase infusion and prior to angiography. The following results were based only on those patients with angiographic data and include 20 patients (10 men and 10 women) with acute myocardial infarction who received intravenous streptokinase. Of these, one patient had had a subendocardial myocardial infarction with T wave inversion in the precordial leads and normal cardiac enzymes two months earlier. None of the 20 patients had evidence of congestive heart failure. The 12-lead electrocardiogram revealed ST segment elevation in the anterior leads in seven patients and in the inferior leads in 13 patients. By cineangiogram the right coronary artery was involved in eight, circumflex artery involved in five, and anterior descending in seven. Of the 20 patients, seven had single vessel disease, six had double vessel disease, and seven had triple vessel disease. The average elapsed time from the onset of the chest pain to the institution of the thrombolytic therapy, was 223 minutes, ranging from 115 to 368 minutes.

Coagulation Results

Following the administration of the streptokinase, the fibrinogen and plasminogen levels decreased, and the fibrinogen derivation product increased. These findings are consistent with induction of a systemic lytic state by the streptokinase.

Morbidity and Mortality

In this study of twenty patients who had coronary arteriography following intravenous streptokinase, one patient experienced an intracerebral bleeding episode. This patient had been transferred to another facility for an urgent coronary angiogram because of persistent chest pain. Results showed severe narrowing in the circumflex artery, and the patient underwent angioplasty. During the angioplasty, large amounts of heparin were used. Six hours following successful angioplasty, the patient had an intracerebral hemorrhage. Although his neurological status gradually improved, the patient expired three weeks later as the result of a cardiac arrhythmia. None of the other patients developed hematoma of other evidence or systemic bleeding.

Discussion

In patients with transmural myocardial infarction, intracoronary streptokinase has been shown to induce rapid thrombolysis in 70-80% of the cases;[3-6] however, intracoronary streptokinase is not feasible in a small community hospital where the majority of the patients present after experiencing chest pain. A large number of them cannot be transported to the tertiary care center where intracoronary streptokinase can be given. Even if they can be transported, a substantial amount of precious time will be lost. The reasonable choice in a small community hospital is intravenous streptokinase, which can be given quickly without the need for a cardiac catheterization laboratory.

Several investigators[9-13] administered high-dose intravenous streptokinase, ie, 1.5 million units over 50-90 minutes, and performed acute coronary angiography to assess its efficacy in establishing reperfusion. Thrombolysis was achieved in one study in 44%[14] and in another in 63%.[11] Ganz et al[8] reported 96% thrombolysis following intravenous streptokinase; however, thrombolysis was judged from indirect criteria; ie, reperfusion arrhythmias and CPK isoenzymes.

Various doses ranging from 250,000 units[17] to 1.5 million units[9-13] have been used. Since there was no consensus, we decided to use the low dose. In the present study 750,000 units of streptokinase was given over one-half hour. Based on angiographic data, this produced reperfusion in 70% of the cases. Since cardiac catheterization was not done immediately, this also includes spontaneous reperfusion as well as spontaneous reclosure. Most importantly, there was a low incidence of complications from the thrombolytic therapy because of low-dose streptokinase, and there was a high rate of reperfusion which may account for the low morbidity and mortality in this small group of patients.

The high reperfusion rate is attributed to administration of streptokinase less than four hours after onset of the chest pain. This is feasible in the small community hospital. Weiss[15] also used streptokinase in a small communtiy hospital and reported a patency rate of about 73%. Neuhaus, et al[11] gave intravenous streptokinase at an average of 3.2 hours after onset of chest pain and achieved thrombolysis in about 63% of the patients. Schroder et al[12] administered the drug at an average of 3.8 hours after the onset of chest pain, and thrombolysis occurred in 52% of the cases. In our study, intravenous streptokinase was given within an average of 223 minutes after the onset of chest pain or within four hours. Hillis et al[16] reported that intravenous streptokinase was given over an average of 270 minutes (+/- 86) after the onset of pain and within four hours in only 16 patients. Similar to the other studies[10-14] the administration of the streptokinase was delayed in each patient until coronary arteriography had been accomplished so that reperfusion could be evaluated directly. Again, these studies were conducted at tertiary care hospitals. In the studies of Rogers et al[4] and Spann et al[13] the average elapsed time from onset of chest pain until administration of the streptokinase was similar to that of Hillis et al. Thus, as reported by others[11-13] the likelihood that intravenous streptokinase will induce thrombolysis appears to be related to the elapsed time from the chest pain, which may be presumed to be the time of thrombus formation. In the community hospital the patients are usually seen earlier and streptokinase is infused sooner, with the elapsed time being consequently much shorter.

Maintenance of Reperfusion

In the present study, reperfusion was sustained in 70% of the patients. All of the patients were given heparin, and the PTT was maintained at more than twice normal for the next four to five days.

Conclusion

The data obtained from 20 consecutive patients with acute myocardial infarction in a small community hospital demonstrate that low-dose intravenous streptokinase achieves thrombolysis in a majority of the patients with persistent vessel patency, close to 70% based on angiographic studies alone. This includes both spontaneous reperfusion as well as spontaneous reocclusion. It is concluded that low-dose intravenous streptokinase, 750,000 units, is safe and is associated with a high patency rate with little morbidity or mortality and can be easily and safely administered in a small community hospital setting.

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Stereotactic Neurosurgery in a Community Setting

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ABSTRACT—Over a one-year period of time, five stereotactic biopsies were performed in the Greater-Bridgeport hospitals using a new burr hole-mounted stereotactic device. We discuss our results as well as some general considerations on the applicability of this material to the community neurosurgeon.

STEREOTAXIS means "orientation within space." It has come to describe a set of maneuvers which enable a surgeon precisely to make contact with a target, the coordinates of which have been established previously by imaging methods, following a trajectory planned on the basis of the same information.

This is not a new technology in itself, since the theory and laboratory animal application was first established by Horsley and Clark[1] in 1906. The first human surgical applications were made during the years immediately following World War II.

For a long time the frames which were attached to the patient's head for neurosurgical stereotaxis were complex and the radiological methods required were extensive and relatively lacking in patient specificity, thus confining these procedures to university centers. This epoch, however, has given way to technological advances of the last few years.

Neuroimaging by computed tomography (CT) and magnetic resonance imaging MRI have revolutionized the anatomical basis for stereotactic neurosurgery, and new devices, with greater precision and simplicity, have been developed. At the present time, given the proliferation of adequate neuroimaging, a larger number of stereotactic devices has been made available to the community surgeon.[1,2,3,4,5,6,7]

Biopsy of deeply located cerebral lesions can be accomplished with the help of intraoperative ultrasound. Ultrasound-guided stereotactic biopsy using a skull-mounted apparatus has been described and is used on a regular basis.[8] Other operators continue to perform free-handed stereotactic biopsy of large tumors, especially when these tumors are well identified by imaging methods.[9]

We performed the first CT guided stereotactic biopsy of a deeply located cerebral lesion in Bridgeport on 23 November 1987; since then four more cases have been done by us as of December 1988. There follows a review of our cases and a discussion of the use of stereotactic surgery in the community hospital.

Technical Note

We used the Pelorus Medco Stereotactic Surgical System as described by Carroll et al.[3] In the *majority* of cases we have combined this system with the G.E. 8800 CT scanner, but have, on one occasion, used the G.E. 9800 CT scanner.

In contrast to the complexity of the frame-mounted system, the Pelorus System is a simple skull-mounted device. It depends upon establishing a frame of reference between the skull and imaging table which is then reproduced on a phantom; coordinates are then transferred back and forth between the imager, the phantom, and the skull. The Pelorus System[3] is a burr hole mounted system with a base plate, secured to the skull at the periphery of the chosen entry point, upon which a variety of secondary plates are attached for reference, for target application acquisition, and for mounting a biopsy needle, or even, as illustrated, arc devices.

Patients

We performed biopsies on four patients in five separate procedures; four of the targets were hemispheric and one was cerebellar. Of the four patients whose cerebral lesions were biopsied, diagnostic tissue was obtained in three (ie, taxoplasmosis was diagnosed in one sample, metastatic adenocarcinoma in another case, and probable cerebral infiltration with AIDS virus in the last).

In one case the biopsy tissue did not yield a diagnosis.

The procedure proved to be entirely without compli-

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cation in three of the patients (two hemispheric and one posterior fossa), but was accompanied by a postoperative epidural collection at the entrance site in the fourth.

There were no operative deaths related to the biopsy procedure, and there were no long-term neurologic sequellae related to these procedures.

Discussion

No surgical procedure involving the human cerebrum is without risk. The gravest mistake would be to consider these stereotactic biopsies to be no more complex than a spinal tap!

The future of stereotaxis may be, to some extent, the future of neurosurgery. It is certain that in some centers, ambitious Laser-assisted tumoral resections, neuro-augmentative procedures, and functional lesions will become regular surgical procedures.[5] However, this entails investment of a high order, including CT scanner and MRI, special mounts for computer-assisted Laser stereotaxis, all of which, in an age of financial retrenchment, is out of reach of the community hospital. However, this is only one facet of the question.

Another modality based on this technique combines radiation energy generated by a linear accelerator with focusing using neurosurgical stereotactic-guiding principles.[8] This precisely focuses high doses of radiation energy to obliterate or "remove" harmful intracranial lesions. This stereotactic radiosurgery becomes an alternative treatment for some brain lesions felt to be inaccessible or unsuitable for conventional neurosurgery. However, at present there are only six of these "gamma knives" in the world, though that number will increase in the years to come.

With the increasing number of lesions identified by the neuroimaging modalities which are now available to the community hospital, a greater number of small, deep, or dominant-hemispheric lesions will require the neurosurgeon's evaluation. Indications for biopsy may thus arise more frequently, and the public will expect that such procedures be attempted.

In addition, given the AIDS epidemic, it may be observed that stereotactic procedures carry a lower risk of blood contamination than do craniotomies, and are thus looked upon favorably by operating room personnel and primary care physicians, especially if the information obtained is reliable. Biopsies are often necessary in the management of this disease, both for short-term prognosis and for appropriateness of therapy (ie, toxoplasmosis *v* lymphoma).

There are advantages in a system such as the Pelorus for the community hospital: the first is that it calculates coordinates directly from the CT scan computer itself without the need for a separate, expensive computer hardware and software; the second is that it is reasonably priced; the third is the short length of time required in the operating suite; and the fourth is the capacity, in cooperation with the radiation therapy section, of performing interstitial brachytherapy, ie, implanting radioactive seeds within the tumors, a procedure that we have used and which appears to provide therapeutic potential.

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Important Advances in Clinical Medicine

Orthopedics

The Scientific Board of the California Medical Association presents the following inventory of items of progress in orthopedics. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist busy practitioners, students, research workers, or scholars to stay abreast of these items of progress in orthopedics that have recently achieved a substantial degree of authoritative acceptance, whether in their own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on Orthopedics of the California Medical Association and the summaries were prepared under its direction.

The Impingement Syndrome and the Rotator Cuff

THE rotator cuff muscles are important stabilizers of the glenohumeral joint and provide a watertight joint space that maintains normal synovial fluid mechanics for cartilage nutrition. Rotator cuff disease is common in two distinct populations. It more commonly occurs in persons older than 35 years who have impingement with progressive supraspinatus degeneration and eventual tearing. The other population usually affected is athletes, aged 18 to 35 years, who do repetitive overhead activities. With continued overuse, their shoulders may become unstable and begin to sublux anteriorly, which scan result in secondary impingement of the rotator cuff.

The roles of subluxation and secondary impingement have not been previously appreciated in the evolution of rotator cuff disease in young athletes. When the arm is continually abducted and externally rotated, stress is placed on the static stabilizers of the shoulder—the inferior and middle glenohumeral ligaments, anterior and posterior labrum, and anterior capsule. With repetitive stress, these structures may stretch or break down, allowing instability and eventual silent subluxation. This subluxation produces impingement of the rotator cuff against the coracoacromial arch, and the athlete will begin to have pain. Thus instability and impingement are not separate disorders but elements on a continuum of shoulder disease starting from overuse during overhead activity and progressing to microtrauma, anterior instability, silent subluxation, and, finally painful impingement of the rotator cuff against the coracoacromial arch.

Patients with shoulder pain can be divided into four groups: Group 1 consists of patients with isolated episodes of impingement (older patients). Group 2 comprises patients who sustain repeated microtrauma from overhead activities, with primary instability and secondary impingement (younger athletes). Group 3 patients are similar to those in group 2 with the addition of hyperlaxity. Finally, group 4 patients have pure instability, usually following a major traumatic event, with symptomatic recurrent subluxation episodes.

The treatment of all groups begins with avoiding overhead activities, using anti-inflammatory medication, and strengthening the rotator cuff and scapular rotators. If not improved after three months, group 1 patients may benefit from decompressing the impingement with an acromioplasty. Group 2 patients require a more specific rehabilitation program that attempts to retrain the rotator cuff to fire in proper synchrony and that emphasizes strengthening of the scapular rotators (kinesiologic repair). If not improved after three months, these patients may require anterior surgical stabilization, with an attempt to minimize postoperative external rotation loss. An acromioplasty may worsen symptoms because the primary problem of instability has not been addressed. Group 3 treatment is similar to that in group 2, with postoperative rehabilitation modified by increasing the period of restricted motion. Group 4 patients usually do

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not improve with rehabilitation and usually require surgical stabilization for improvement.

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Tibial Fracture Update

TIBIAL fractures that are closed and mechanically stable are best treated by a long-leg cast. Unstable and open tibial fractures often benefit from surgical treatment, especially in a patient with extensive injuries. Nonreamed intramedullary nails are the most common choice of orthopedic trauma surgeons for both open and closed unstable fractures. Recent studies indicate that the use of nonreamed intramedullary nails compares favorably with external fixation for grades 1 and 2 compound fractures, and their use avoids some of the complications of external fixation such as delayed union and pin tract infections. External fixation remains the treatment of choice for grade 3 compound fractures. Introducing the interlocking tibial nail allows for the control of length and rotation in complex fractures. Delayed union or nonunion is treated by early bone grafting using a posterolateral approach. Bone marrow and hydroxyapatite are being investigated as substitutes for bone grafts.

The high-energy open tibial fracture remains a difficult problem. The prompt recognition of vascular problems and early arterial repair with fasciotomies, stabilization with an external fixator, and early wound coverage using free or local flaps can lead to a more acceptable salvage rate. The anterior half-pin external fixator allows easy access to soft tissues and better nursing care. Severe crush injuries or severely damaged tibias with no posterior tibial nerve function and major muscle loss should be considered for early amputation.

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Diagnosing and Treating Chronic Distal Radioulnar Joint Pain

ULNAR wrist pain has the reputation of being an extremely challenging clinical disorder. A careful clinical evaluation and standard x-ray films will sometimes fail to reveal the cause of the problem. In such situations, diagnosis and treatment can be aided by the newer techniques of the past several years—that is, scintigraphy, arthrography (sometimes in combination with fluoroscopy), computed tomography, arthroscopy, and magnetic resonance imaging.

Pain in the distal ulnar region can result from carpal lesions such as local arthritis or from pathologic disease of the triangular fibrocartilage complex (TFCC) or the radioulnar joint itself. A tear or peripheral detachment of the TFCC can be detected by wrist arthrography if dye is injected into the radiocarpal or distal radioulnar joint. An abnormality of the TFCC would be evidenced by an extrusion of dye across the complex. In elderly patients, this finding is not necessarily abnormal, so further investigation would be needed. The diagnosis can be confirmed by arthroscopy, which may also be used to debride a tear. Often tears in the TFCC can be observed noninvasively by magnetic resonance imaging, a technique that will undoubtedly be put to greater use in diagnosing wrist problems.

If the disease resides in the distal radioulnar joint itself, several treatment options are available. Ulnar shortening procedures are effective if the joint is intact but the ulna is simply longer than the radius. This increased ulnar variance often occurs as a result of a Colles' fracture. If the joint is also abnormal, other means of resolving the pain and improving forearm rotation must be sought. The Darrach procedure, long considered the mainstay of treatment of this type of problem, consists of resecting the distal ulna. Such resection, however, may fail to reduce the pain and, with excessive ulnar resection, may result in distal instability.

The importance of preserving the integrity of the ulnocarpal ligament complex has been emphasized. The reason for doing so is to maintain the TFCC and thus maintain stability of the ulnar side of the wrist. In response to this requirement, modifications of the Darrach procedure have been described. The hemiresection-interposition arthroplasty is one variation. Another is the matched ulna resection, wherein the distal ulna is partially resected so that the remaining segment parallels the contour of the distal radius and the stabilizing ligaments of the distal ulna are retained. Last, the Lauenstein procedure—sometimes called the Suave-Kapanji procedure—involves arthrodesis of the distal radioulnar joint along with resection of a 1- to 2-cm section of the distal ulna just proximal to the site of arthrodesis. This technique is effective in reducing pain and restoring forearm rotation while maintaining full support for the ulnar side of the carpus.

Thus far, no single procedure has been uniformly successful. The principles of treatment are yet to be fully elucidated and hinge on a broader understanding of structure and function. Until that point of understanding has been reached, this particular area of orthopedics will remain a focus of active clinical investigation.

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Diagnosing Internal Derangement of the Knee With Magnetic Resonance Imaging

INTERNAL derangement of the knee represents a common medical problem with significant patient morbidity. Although arthroscopy has been used increasingly in the diagnosis—and treatment—of such derangements, less invasive diagnostic techniques can be used effectively before or in place of arthroscopy if they are accurate. In recent years, magnetic resonance (MR) imaging has proved to be a reliable method and, in many instances, has replaced arthrography in the evaluation of internal derangements of the knee. The advantages of MR imaging include excellent spatial and contrast resolution, direct multiplanar imaging capability, and the absence of a known biologic hazard.

Magnetic resonance imaging is particularly valuable in analyzing intra-articular soft tissue structures, including the menisci, cruciate and collateral ligaments, and the hyaline cartilage of the patella, the distal portion of the femur, and the proximal portion of the tibia. When done by experienced physicians, the accuracy of the MR examination in evaluating the menisci has been reported to be 90% to 95% (sensitivity 95%; specificity 91%). Similar accuracy has been evident in the diagnosis of cruciate ligament disruption. In these assessments, arthroscopy usually has been used as the gold standard, although it has been argued that owing to the ability of MR imaging to delineate intrameniscal alterations, some of the falsely abnormal MR results may, in reality, represent falsely normal arthroscopic examinations. As with any diagnostic examination, however, pitfalls in interpretation exist when the magnetic resonance study is done by persons who lack considerable experience and expertise.

Preliminary data also indicate the MR imaging holds great promise in the detection of focal or diffuse abnormalities of the articular cartilage in patients with osteoarthritis, osteochondritis dissecans, and chondromalacia patellae. The presence of a joint effusion is beneficial in the delineation of such chondral alterations, and, in the absence of joint fluid, some investigators have advocated introducing saline (or gadolinium) before the MR examination (MR arthrography).

Kinematic MR examinations, in which a series of transaxial images are taken at various degrees of knee flexion, have been used to assess tracking abnormalities of the patellofemoral joint, providing new insight into patellar subluxation and dislocation.

The major disadvantages of MR imaging include its high cost and lack of availability. Recent technical advances using pulse sequences that tilt the net magnetic moment vector at an angle of less than 90 degrees allow the examination to be done in a shorter period of time with decreased cost; furthermore, with an increasing number of magnetic resonance installations in the United States and abroad, availability is becoming less of an issue.

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Treating Scoliosis

TO determine the appropriate treatment of scoliosis, the natural history of the disease process must be understood. It is now known that in only a small percentage of skeletally immature patients curves less than 20 degress will prove progressive. Factors that help to predict the risk of progression include the age of onset (the younger age has a higher risk); curve pattern (thoracic curves have the highest risk of progression); menstrual history (the risk of significant curve progression is three times higher for a premenarchal girl than a woman who is postmenarchal); the Risser sign of iliac apophyseal growth (risk is three times greater for Risser stage 2 or less than for a Risser stage greater than 2); and curve severity (risk of progression is about 20% for a 20-degree curve, 60% for a 30-degree curve, and 90% for a 50-degree curve).

The indications for nonoperative treatment have changed substantially in recent years based on this improved knowledge of the natural history. As it is now appreciated that most curves of less than 20 degrees do not progress, treatment is usually not recommended unless the curves are greater than 25 degrees or there is a progression of 10 degrees or more before treatment. As it is well documented that the risk of curve progression decreases dramatically after menarche, brace treatment would be started for few patients who have reached this stage.

The Milwaukee brace has been largely supplanted by thermoplastic thoracolumbar spinal orthoses that are form-fitting and easily concealed by clothing. Treatment protocols have traditionally required 23 hours per day until skeletal maturity is reached, followed by a gradual weaning program. Recent information indicates that part-time brace wear—16 hours per day-may be sufficient to arrest curve progression in many cases. As cosmetic appearance is not expected to improve with brace treatment, an unacceptable appearance contraindicates brace treatment.

Electrical stimulation of the convex side of the curvature has been tried both as an implanted system and by surface stimulation. Although some investigators disagree, the results of this method of treatment in several series have not shown any improvement over that expected by natural history alone.

The Harrington rod remains the gold standard of operative treatment. Instrumentation alone, however, is inadequate to preserve the correction, and a solid arthrodesis must always be obtained. Segmental fixation of the spinous processes to the Harrington rod may be accomplished using the Wisconsin wiring technique. Segmental fixation may also be accomplished using sublaminar wires attached to a rod placed on either side of the midline as described by Luque. Some series have reported an increase in neurologic morbidity from this procedure. Cotrel-Dubousset instrumentation is the most recent implant to become available. Its advantages include the ability to create both distractive and compressive forces on the same rod, to recreate thoracic kyphosis and lumbar lordosis, and to create fixation sufficiently stable that postoperative external immobilization is unnecssary.

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Magnetic Resonance Imaging in the Evaluation of Children's Spine Disorders

BACK pain is uncommon in children and adolescents and deserves a thorough evaluation. A technetium bone scan remains the most useful test in localizing the source of nonspecific signs and symptoms or with a suggestion of infection. Magnetic resonance imaging (MRI), however, is the most definitive and cost-effective imaging technique for diagnosing and evaluating children's spine disorders not diagnosed by standard radiographs. Recent reports have documented MRI findings in cases of pediatric infection, neoplasia, and congenital vertebral anomalies. If a history, physical examination, and standard radiograph localize the problem, the MRI has proved helpful in further elucidating both pathologic anatomy and physiology.

The uncommon problem of pediatric spine infection has been an issue of primary disc space infection versus osteomyelitis with extension into the disc space. In osteomyelitis and neoplasia, T1-weighted images have shown decreased signal intensity within affected vertebral bodies. T2-weighted images often reveal sparing of the disc space with neoplasia and involvement of the disc with infection. A report of MRI scanning in a child with classic physical and plain radiographic findings of diskitis revealed (on T1-weighted images) osseous involvement above and below the narrow disc consistent with osteomyelitis. Likewise, a child's hamstring tightness, paravertebral spasm, and altered gait could be explained by the posterior herniation of narrowed lumbar disc into the spinal canal, as noted on T2-weighted images. The noninvasive, nonionizing nature of MRI has offered new information on a historically self-limited condition in which invasive studies are usually not justified.

Congenital vertebral anomalies can involve both osseous and neural elements, and invasive studies have been required to fully evaluate the onset and progression of pain, neurologic deficit, and deformity. Magnetic resonance imaging is useful in detailing spinal cord anomalies such as syringomyelia, tethered cord, diastematomyelia, and lipoma. Myelography remains the first choice where the three-dimensional change in patients with severe deformity prevents adequate MRI imaging.

A disadvantage of MRI is the potential need for sedation in a child reacting claustrophobically to the gantry and the intimidating sounds of the scanner. Metallic spinal implants, being nonmagnetic, do not present a danger, but they do distort the image throughout their length. Good resolution can usually be obtained above and below the level of the hardware. Magnetic resonance imaging has become a useful diagnostic tool and, with more experience, may offer new insights into the etiology and pathophysiology of children's spinal disorders.

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Fractures of the Distal Radius

ABOUT 80% of all fractures of the radius occur at the distal end of the bond. The goal of treatment is to restore the anatomic relationship of the distal end of the radius to the carpus (radiocarpal joint) and to the distal ulna (radioulnar joint). Fortunately, a typical Colles' fracture can be effectively treated by closed manipulation and stabilized with a well-molded above-the-elbow cast for five weeks. Slight palmar reduction of the fracture, and extreme palmar flexion of the wrist is contraindicated.

If a fracture is unstable, or the fracture reduction cannot be maintained with a plaster cast, then external fixators have been effective in stabilizing fractures once they have been properly reduced. It is extremely important to understand that a poorly reduced fracture of the distal radius will not improve merely by applying an external fixator. The better the restoration of the bony and articular alignment of the radius, the better the end result after the fracture has healed.

High-velocity injuries of the distal radius that frequently occur in younger patients are difficult to treat. These fractures are often intra-articular, involving both the radiocarpal and distal radioulnar joints. Comminution is often another component of these fractures. Many of these intra-articular fractures in young adults are best treated by open reduction and internal fixation. The fractures can be stabilized by smooth Kirschner wires or a buttress compression plate. This seems to be the best method of restoring the anatomic relationships at the radiocarpal and distal radioulnar joints. Wrist arthroscopy may be a useful adjunct to examine the restored articular surface of the distal radius. A high incidence of posttraumatic arthritis at the radiocarpal joint has been found in younger patients in whom there is residual incongruity of the radiocarpal joint.

Despite our best efforts to properly treat fractures of the distal radius, almost a third of these fractures are associated with some complications, involving either bone or soft tissue. Some of these complications are transient, while others may require secondary reconstructive procedures.

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Administering Steroids in Unicameral Bone Cysts

UNICAMERAL bone cysts are cystic, fluid-filled lesions that develop principally in the proximal humerus (70%) or proximal femur (25%) during childhood and adolescence. Pathologic fracture through the thin cortical wall is the usual event leading to diagnosis. To avoid repeated fractures with a resultant shortening or deformity is the main motivation for treating the cyst.

For several decades before 1975, the "standard" treatment for bone cysts consisted of curettage and bone grafting, either with banked bone or autologous iliac crest bone. The magnitude and morbidity of this procedure, coupled with a success rate of only 50% to 60% in obliterating the cyst, led to research on alternative treatments.

In 1973 Scaglietti of Florence found that the fluid obtained from bone cysts was chemically similar to edema fluid and the lining tissue contained scattered inflammatory cells. He began a clinical trial of injecting cysts with methylprednisolone acetate, a potent and relatively insoluble synthetic corticosteroid. When used in growing children, the treatment stimulated bone formation in the cyst cavity that either completely obliterated the cyst or produced sufficient healing that further fractures would not occur.

The cyst injection procedures is generally done with the patient under brief general anesthesia and is aided by image-intensified flouroscopy. Large spinal needles or, when necessary, bone biopsy needles are drilled through the proximal and distal aspects of the cyst wall. While the lesion is viewed by fluroscopy, the cyst is irrigated with diatrizoate meglumine (Renografin) or a similar contrast material by injecting through one needle and allowing the fluid to exit through the other. This confirms that the lesion is a bone cyst and that it is composed of a single chamber. If the lesion does not fill like a cyst, a biopsy, either open or by needle, should be done. If more than one chamber is identified, two needles should be placed into each chamber and each injected separately. The use of only one needle to inject a chamber causes an increase in the intraosseous pressure and considerable pain for one to two days. Once the chamber(s) is shown radiographically, methylprednisolone acetate (Depo-Medrol), 40 or 80 mg per ml, is injected, the total dose ranging from 40 to 200 mg depending on the cyst volume. The needles are withdrawn, and a pressure dressing is applied to the puncture sites.

If a prompt contrast venogram is produced, the likelihood of the cyst responding to the steroid injection is decreased because much of the steroid probably will leave the cyst cavity shortly after injection.

Because injection can lead to transient demineralization of the cyst wall, it is prudent to protect the involved bone from trauma for at least two months after injection. X-ray films are taken at two-month intervals. The maximum increase in density after a single injection typically occurs at four to five months, at which time a decision is made regarding the need for further injections. In 10% to 25% of cases, healing occurs with a single injection. The rest generally will heal with further injections (seldom more than four) either completely or sufficiently that the risk of further fracture is minimal.

In view of the high success rate, low morbidity, and relatively low cost, corticosteroid administration is generally the initial appropriate therapy for unicameral bone cysts in immature patients. Bone grafting should generally be reserved for cysts that fail to respond to multiple injections or cysts that present after physeal closure.

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Internal Fixation of Degenerative Disease of the Lumbar Spine

THE surgical treatment of degenerative disease of the spine frequently involves both laminectomies and fusions. Attempts at fusion can result in nonunion. The incidence of nonunion increases when the number of levels involved in the fusion increases. Fusions of the lumbar spine are also done to correct deformities. These challenges have motivated the design of various devices for internal fixation.

Most designs of devices for internal fixation have incorporated instruments used in treating scoliosis. The two most common types have been the Harrington rod, a hook and distraction system, and the Luque system, which uses a metal rod with wires that are placed beneath the various laminae, pulled around the rod and then tightened. Although these systems have worked well in patients with thoracic scoliosis, neither of them has given solid fixation in the lumbar spine because it is more mobile and has greater ranges of motion than the thoracic spine.

There have been other systems adapted to the lumbar spine, such as Knodt rods, Weiss springs, and Luque rings, but none of these have produced secure fixation. The use of these systems may also result in a loss of lumbar lordosis, causing the patient to stand in a constantly flexed position. In 1976 a system of placing screws in the pedicle and attaching them to plates was developed in France. This provided rigid fixation in the lumbar spine.

Since then, numerous variations of the plate-and-screw or rod-and-screw system have been developed, permitting surgeons to secure fixation with control of spinal alignment. A number of complications may develop with these systems, however. There may be a pronounced increase in the infection rate, two to three times that of other surgical procedures, both because of the implant itself and because of the length of the operation. Broken screws and a loss of fixation can also occur. With some patients who have osteoporosis, it is difficult to gain good purchase with the screw, so the procedure must be done with caution. In addition, there may be an increased incidence of degeneration of the first mobile segment above the fusion because of stresses transferred by the rigidity of the fixation devices.

Because of the complications, these implants must be used selectively and with great caution by someone who is familiar with both spine surgery and the systems of internal fixation of the spine. Great care must be taken by those who embark on this to train adequately, both in the laboratory and in the operating room, before they do this procedure by themselves.

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The Management of Giant Cell Tumors of Bone

GIANT cell tumor of bone is a benign neoplasm found typically in the end of long bones in patients in their third and fourth decades. The surgical treatment most commonly used over the past 20 years has been a conservative curettement of the lesion and packing of the defect with some form of bone graft material. Two years following this primary attack on the tumor, the recurrence rate has been about 30%. Because of this high failure rate, many surgeons in larger centers have taken a more aggressive approach to the problem by suggesting a wide resection of tumor including the adjacent joint surface. The large resulting defect is then replaced with an osteochondral allograft, total joint prosthesis, or an arthrodesis. Indeed, with this aggressive approach, the recurrence rate dropped to around 5% but at a high price of functional disability for the lifetime of a young patient with an excellent prognosis for a long life.

For the past decade a new approach has been taken to reduce the significant disability resulting from these more aggressive wide resections and at the same time keep in line with a 5% recurrence rate. This approach has been an aggressive curettement of the lesion followed by packing of the surgical defect with bone cement commonly used in total joint arthroplasty. The procedure is relatively simple compared with large bone grafting or prosthetic operative procedures, and the complication rate is low. Patients are allowed the early use of the involved joint because of the immediate stability provided by the cement replacement of even large surgical defects frequently created just beneath the joint surface. It must be emphasized that the curettement must be aggressive and supplemented by the use of high-speed dental burs and water-pick lavage of not only the bone defect but the surrounding soft tissue as well. In the few cases where recurrence has resulted, the problem can usually be handled by a simple local debridement of the recurrent area without removing the entire cement block and with minimal injury to the adjacent joint. Although long-term results are not yet available, at this time this procedure holds considerable promise for better results than previously achieved.

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Free Tissue Transfer in the Salvage of Traumatized Extremities

OPTIONS for reconstructing massively traumatized extremities have increased dramatically over the past dozen years due primarily to the development of microsurgical techniques and the description of numerous free tissue-donor sites. Extensive bone and skin loss in an extremity is often compounded by crush injuries to vessels, nerves, and muscles. Free vascularized tissue transfers are one-stage procedures to provide distant site coverage, permitting surgeons to select a donor site that best meets the specific needs of a recipient site in order that form, contour, and function may be reconstructed.

Besides providing well-vascularized coverage to enhance healing and prevent infection, transferred tissue can include free cutaneous grafts that may be innervated to provide sensation, free muscle grafts that may be innervated to restore active motion, and vascularized bone that can effectively bridge large bony gaps. In some series, free tissue transfer has been successful in 80% to 90% of cases.

While initially reserved for delayed reconstruction, there now is a great interest in emergency free flap operations. In extensive traumatic defects, the immediate transfer of distant skin, muscle, or myocutaneous flaps may save injured structures from additional loss caused by desiccation, infection, and fibrosis. In Yugoslavia the flap failure rate, infection rate, bone healing time, and duration of hospital stay have been decreased in patients undergoing free tissue transfer within the first 72 hours of injury compared with those patients whose treatment was delayed. This experience needs to be duplicated in this country.

Whether immediate or delayed, free tissue transfer has become the treatment of choice for reconstructing massive soft tissue and bony defects. With the application of microsurgical techniques, many limbs that previously would have been amputated can now be salvaged.

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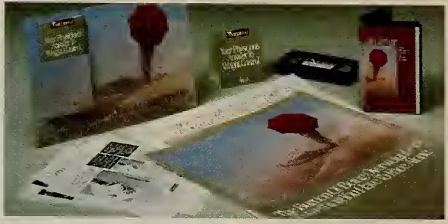

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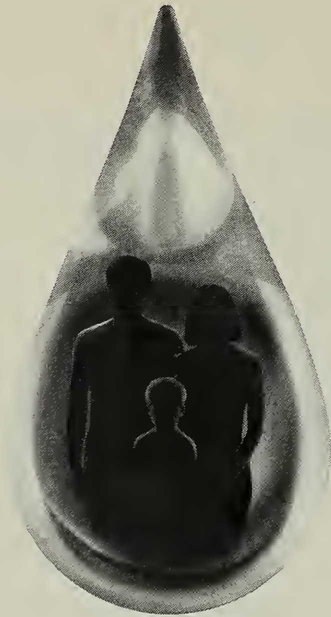

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DRUG INFORMATION UPDATE: HARTFORD HOSPITAL

Therapeutic Drug Monitoring of Cyclosporine (CSA)

ELIZABETH BUONPANE, PHARM.D.

CYCLOSPORINE (CSA) has proved to be a valuable addition to the immunosuppressive armamentarium of organ transplantation since its introduction in the United States in 1983. In addition to significant improvements in graft survival rates noted in renal, hepatic, heart, heart-lung, and pancreatic transplantations, this drug has been used for prevention of graft versus host disease in bone marrow transplantation and is undergoing evaluation for treatment of psoriasis, multiple sclerosis, diabetes mellitus, and other autoimmune diseases.[1]

Therapeutic Range

CSA has a narrow therapeutic index, particularly with regard to nephrotoxicity (NT). The variation in therapeutic ranges reported for CSA from different transplant centers is a result of multiple factors some of which include type of biological fluid analyzed and criteria used for rejection and nephrotoxicity.[1,2] At Hartford Hospital, CSA concentrations aimed for in kidney, liver, and heart transplant patients are listed below. Concentrations will vary depending upon the clinical status of the patient and evidence of toxicity.

	CSA Concentrations (ng/ml) by monoclonal radioimmunoassay (blood)	
Time posttransplant	Kidney	Liver or Heart
First two months	150-200	300-400
Six months-one year	150	300
After one year	100-150	250-300

Dosage

There is considerable variation in CSA dosing among transplant centers in the United States. Since CSA's introduction in 1983 lower doses are more commonly used today in combination with corticosteroids and azathioprine. At Hartford Hospital, no CSA is administered preoperatively. After transplanation, 2mg/kg/day of CSA is given as a constant IV infusion over 24 hours. When the patient is able to take oral CSA, 6mg/kg/day is given in two divided doses twelve hours apart. These doses are adjusted as needed to achieve optimal immunosuppression and avoid drug toxicity. Target CSA concentrations are also used to guide dosing.

Method of Analysis

The polyclonal nonspecific radioimmunoassay (RIA) method measures CSA metabolities and the parent drug. Consequently, CSA concentrations may be 1.5-3.5 times that obtained measuring parent compound only by high pressure liquid chromatography (HPLC) or a specific murine monoclonal RIA assay.[2] Whole blood is the preferred biological fluid for assays measuring parent drug whereas serum is preferred for nonspecific RIA methods.[4] The RIA method is easier and quicker to perform than the HPLC method. At Hartford Hospital, both an HPLC assay and a specific monoclonal RIA assay are used.

Absorption

The oral absorption of CSA is variable and incomplete. Bioavailability in transplant populations has ranged from 4% to 90%, with a mean value of 30% reported. Since the time needed to achieve the maximum concentration varies between three and six hours after oral administration, trough CSA concentrations should be obtained. There is a poor correlation between dose of CSA and steady state concentration due to many factors that effect the absorption of CSA. Bile is necessary for the absorption of CSA which is a fat soluble compound. Therefore conditions associated with a bile deficit may cause impaired absorption. Biliary obstruction, poor hepatic function, biliary diversion, and other causes of decreased bile output will affect CSA absorption after liver transplantation. Post operative ileus and diarrhea decrease CSA absorption. Absorption may increase with time after transplantation. During the first three months postoperatively, bioavailability can increase by 50%. The effect of food on CSA absorption is controversial. Therefore, it is the trend of CSA concentrations for each patient that becomes important to follow.[1,2,5-7]

Distribution

The distribution of CSA is influenced by temperature, hematocrit, and the lipoprotein profile. At physiologic

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Editors: Moses Sing Sum Chow, Pharm.D. and Robert A. Quercia, M.S., R.Ph.

temperatures, approximately 50% of the drug is sequestered in erythrocytes, 10% in leukocytes, and 40% is in the plasma. Unless serum samples are allowed to equilibrate for two to three hours at room temperature before separation, measured concentrations will not reflect concentrations in vivo. To avoid this problem, whole blood is often recommended as the biological fluid for sampling.[1,4] There is a large variation in clearance and volume of distribution within and between patients even when sampling with the same biological fluid and using the same type of assay.[1,7,8]

CSA is a highly protein bound (98%) drug, predominantly to lipoproteins, HDL and LDL. The volume of distribution varies among different transplant populations and between young and elderly patients.[1,2] Although CSA is a lipophilic drug and body fat contains a high concentration of CSA, no difference in volume of distribution (or clearance) was observed in one study between obese and nonobese bone marrow transplant patients.[9] As CSA does not readily cross the blood brain barrier, central nervous system toxicity is thought to be due to either a disturbance in the blood brain barrier or related to factors such as hypomagnesemia, high-dose corticosteroid therapy, hypertension, and hypocholesterolemia.[1,10,11] During pregnancy CSA is present in amniotic fluid and also has been detected in breast milk. Breastfeeding is not recommended for infants of mothers receiving this drug.[1]

Metabolism and Elimination

CSA is primarily metabolized in the liver by the cytochrome P-450 enzyme system. Less than 1% of a dose is excreted as unchanged drug into the urine so that altered renal function does not necessitate dose changes. Twelve metabolites have been identified thus far, however, the significance of the immunosuppressive activity and toxicity of several of the metabolites is not well characterized.[1,12] The metabolites are enterohepatically recirculated in the bile and excreted in the feces. Many factors may alter the clearance of CSA. Elderly transplant patients tend to have lower clearances than young patients. Heart transplant patients have a lower clearance than kidney or liver transplant patients. These factors may affect drug dosing. Reported mean half-life values for renal, liver, and heart transplant patients are 10.7, 5.5, and 6.4 hours, respectively. Less than 1% of a dose of CSA is removed by a four hour period of hemodialysis. The effects of peritoneal dialysis are not known but are expected to be similar to hemodialysis.[1,2,6]

Drug Interactions

Drugs which stimulate the hepatic P-450 enzyme system and therefore decrease CSA concentrations include, phenytoin, carbamazepine, phenobarbital, isoniazid, rifampin, nafcillin, and sulfamethazine - trimethoprim (IV).[13-15] Drugs which inhibit hepatic P-450 enzymes and increase CSA concentrations include ketoconazole, erythromycin, metronidazole, diltiazem, verapamil, nicardipine, high-dose corticosteroids, cimetidine, danazol, and oral contraceptives.[1,13,15,17] Recent data indicate that the mechanism by which erythromycin increases and phenytoin decreases CSA concentrations is due to changes in the absorption of CSA rather than either drug interfering with CSA's metabolism.[18] Coadministration of metoclopramide with CSA, has increased the rate and extent of CSA absorption.[19]

Additive nephrotoxicity (NT) may occur if CSA is given with any of the following drugs: aminoglycosides, amphotericin, melphalan, TMP-SMX, TMP, ciprofloxacin, cephalosporins such as cephradine, cefotaxime and cefuroxime and non-steroidal anti-inflammatory drugs (NSAIDS).[13,20,21]

CSA oral and intravenous solutions contain significant amounts of alcohol so concurrent use of drugs known to interact with alcohol should be used cautiously, if at all. These include disulfiram, cefamandole, cefoperazone, moxalactam, metronidazole and chlorpropamide.[15]

Potassium sparing drugs should also be used cautiously with CSA because of CSA induced hypoaldosteronism. Examples of these drugs include potassium sparing diuretics, converting enzyme inhibitors, NSAIDs, and heparin.[15,22]

Nephrotoxicity vs Rejection

The most difficult problem with CSA monitoring in organ transplantation has been to achieve an adequate immunosuppressive effect without developing NT and to differentiate CSA NT from rejection in renal transplant patients. CSA NT is characterized by a gradual decrease in the glomerular filtration rate and gradual rise in serum creatinine (more rapid changes occur with rejection), tubular dysfunction, decreased renal perfusion, and structural damage to the convoluted portion of the proximal tubule.[23] Decreasing the dose or discontinuing CSA may lead to a gradual improvement in renal function. CSA NT may be associated with a stable serum concentration of beta-2 microglobulin, whereas rejection may be associated with an increase in serum beta-2 microglobulin.[1,28,30] A renal biopsy can also be performed to help differentiate drug toxicity from rejection. CSA NT may occur in 20% to 83% of patients who receive the drug and appears to peak between six and 12 months after transplantation. It is usually reversible although evidence of chronic nephropathy has been demonstrated in transplant patients and in patients with autoimmune disease treated with CSA.[24,27] The relationship between CSA drug concentrations and nephrotoxicity is, at best, inexact. Approximately 30% of renal transplant patients experience rejection or NT despite concentrations within the target range. Although NT is difficult to avoid, maintaining CSA concentrations within a target range, using low CSA doses in combination with one or two other immunosuppressant drugs, and avoiding, if possible, the concurrent use of other nephrotoxic drugs may help to decrease the incidence of this adverse effect.[1,23,28,29]

The vehicle, Cremophor EL® in the intravenous form of CSA has been shown to be nephrotoxic in rats, however, it is not known if this is true in humans.[1]

Trough Level Versus Pharmacokinetic (PK) Monitoring

Current practice in the majority of transplant centers involves dosage adjustment based upon target trough concentrations. However, the major limitation of this method of dosage adjustment is that despite maintaining concentrations within an acceptable target range, as much as 50% of patients may experience clinical complications related to CSA therapy.[4,31] To try to avoid or minimize these problems, PK dosing strategies are currently being developed to generate individual parameters, such as clearance and volume of distribution.[4,6,29,33] Preliminary work thus far has shown that there is a good correlation between CSA NT and a high area under the plasma concentration curve, a low drug clearance rate, and a small volume of distribution. Although PK dosing may be more complicated than dosing based on trough concentrations, this method, if successful, could help decrease the number of hospital admissions for nephrotoxic complications of CSA.[4,29]

Conclusion

CSA's uses have expanded from the area of transplantation to clinical trials in the therapy of autoimmune diseases. Understanding the pharmacokinetics of CSA in relationship to immunosuppressive efficacy, nephrotoxic, and other adverse effects is becoming increasingly important. With regard to organ transplantation, CSA concentrations should be obtained daily or every other day in the early postoperative period. Three to four months after transplantation, the frequency of obtaining CSA concentrations will vary depending on the clinical status of the patient, compliance, and presence of other drugs which may interact with CSA. The clinical applicability of pharmacokinetic dosing strategies to calculate an appropriate CSA dose remains to be determined.

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Needles and Syringes

DEPARTMENT OF CONSUMER PROTECTION

The Department of Consumer Protection has promulgated regulations on the "Safe Handling and Disposal of Hypodermic Needles and Syringes" (Connecticut Law Journal, 6 June 1989). These regulations are reprinted below:

Safe Handling and Disposal of Hypodermic Needles and Syringes

The Regulations of Connecticut State Agencies are amended by adding new Sections 21a-66-1 through 21a-66-3 as follows:

Sec. 21a-66-1. Definitions

(a) **Hypodermic Needles and Syringes** means needles, syringes and any other types of intravascular device including but not limited to indwelling catheters and introducers, except that needles which are specifically used to administer antineoplastic agents shall be handled in accordance with existing Department of Environmental Protection Regulations for the handling of such wastes.

(a) **Biomedical Waste** means untreated solid waste which requires special handling as defined in Sec. 22a-207 (17) of the Connecticut General Statutes.

(c) **Treatment** when used in connection with biomedical waste, means any method, technique, or process which is designed to change the character or composition of any biomedical waste so as to render such waste non-infectious, non-injurious, safer for storage, for transport, and reduced in volume.

Sec. 21a-66-2. Safety procedures concerning hypodermic needles and syringes

Each health-care institution licensed pursuant to Chapter 368v of the Connecticut General Statutes, each laboratory licensed pursuant to Section 19a-30 of the Connecticut General Statutes, and all other generators of the bio-medical waste as defined in Section 22a-207 of the Connecticut General Statutes, as amended, shall forthwith establish and implement procedures for the handling and disposal of hypodermic needles and syringes in accordance with the following safety and control measures.

(a) Used hypodermic needles and syringes shall be placed intact directly into rigid puncture-resistant containers and the following procedure shall be followed:

(1) Needles shall not be resheathed, purposely bent, broken, removed from disposable syringes, or otherwise manipulated by hand;

(2) Notwithstanding the requirement set forth in Subsection a) (1), injectable equipment having self-contained secondary precautionary type sheathing devices may be utilized in accordance with its manufacturer's directions, and resheathing may occur when technical procedure involved requires resheathing as part of that procedure;

(3) Containers shall be located in close proximity to the area in which hypodermic needles and syringes are used to minimize the hazards of injury or transmission of infection during transport;

(4) The container lid opening shall be a one way system to prevent spillage, and this shall render the items contained therein nonreuseable;

(5) Containers shall be maintained under secure conditions at all times; and

(6) Prior to treatment, containers shall be stored in a designated area accessible only to authorized personnel.

(b) Containers of hypodermic needles and syringes shall be considered to be biomedical waste, and shall be treated to render them non-recoverable in accordance with any existing Department of Environmental Protection Regulations regarding biomedical waste or in accordance with any other methods specifically approved by the Commissioner of Consumer Protection in consultation with the Commissioners of Health Services and Environmental Protection.

(c) If treatment is not done onsite, these wastes shall be safely transported in sealed, impervious containers to another facility for appropriate treatment.

(d) Personnel involved in the handling and disposal of hypodermic needles and syringes shall be informed of the potential health and safety hazards, and trained in the appropriate handling and disposal procedures.

(e) Each facility shall monitor staff performance for adherence to the established handling and disposal procedures.

(f) Policy for disposal of these wastes by a health care facility shall be available for review by the Department of Health Services or the Commissioner of Consumer Protection.

Sec. 21a-66-3. Purchase, possession, control and use of hypodermic needles and syringes

(a) The purchase, possession, control, and use of hypodermic needles and syringes by commercial or industrial firms pursuant to Section 21a-65(a) (6) of the Connecticut General Statutes shall be considered to be authorized by the Commissioner of Consumer Protection provided that such businesses attest to the following in a written statement which they shall provide to the commissioner:

(1) that there exists an essential need for such devices in any function of their operations;

(2) that there are no devices, tools, or equipment modifications which may be used as an alternative to the use of hypodermic needles and syringes;

(3) that there shall be maintained only those quantities of hypodermic needles and syringes which are essential for normal efficient operations;

(4) that security safeguards and inventory control systems have been established which are adequate to detect any loss or diversion of hypodermic needles and syringes; and

(5) that access to stocks of hypodermic needles and syringes is limited to only those employees who have a legitimate need to handle these devices in the normal course of business.

(b) It shall be within the discretion of the Commissioner to determine whether such firms meet the requirements of subsection (a) of this section.

Statement of purpose: To promulgate regulations in accordance with Public Act No. 88-357, to ensure that hypodermic needles and syringes are purchased only by authorized businesses, and used solely for their intended purpose, and are disposed of safely in a manner that will reduce the risk of injury and prevent the transmission of disease.

Note from Matthew Cartter, M.D.*: The regulations from the Department of Consumer Protection are part of a larger package of regulations related to medical waste handling and disposal.

The State of Connecticut Department of Environmental Protection's (DEP) regulations for biomedical waste are being finalized and should be in effect in 1990. The United States Environmental Protection (EPA) regulations promulgated as a result of the Medical Waste Tracking Act of 1988 took effect on 22 June 1989. The Department of Labor, Occupational Safety and Health Administration (OSHA) has also proposed regulations regarding occupational exposure to bloodborne pathogens (29 CFR Part 1910, Federal Register, 30 May 1989) which also affect the handling of sharps.

All of these regulations will concern Connecticut physicians, either as generators of medical waste or employers of personnel in a health care setting. For questions regarding obligatons under the EPA or DEP regulations, call Bill Howard at the DEP (566-5847) or Pat Checko at the Department of Health Services (566-1980). For questions concerning the OSHA regulations, call the State of Connecticut Department of Labor, Occupational Safety and Health Division at 566-4550.

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* Dr. Cartter is Epidemiology Program Coordinator, Connecticut Department of Health Services.

MARK YOUR CALENDAR

198TH ANNUAL MEETING
CONNECTICUT STATE MEDICAL SOCIETY
MAY 9, 10, 1990
RAMADA INN, MERIDEN, CONNECTICUT

MAY 9 — ANNUAL MEETING OF THE HOUSE DELEGATES
MAY 10 — CSMS SECTION MEETINGS

Therapeutic Endoscopy and Bleeding Ulcers

NATIONAL INSTITUTES OF HEALTH

PEPTIC ulcer disease is a major health problem in the United States that affects more than 4 million people each year. Bleeding is one of the most dread complications of peptic ulcer. Upper gastrointestinal bleeding is a common cause of emergency hospitalization in the United States. It has been estimated that more than 100 000 patients with peptic ulcer disease bleed each year. Morbidity and mortality from ulcer bleeding remain significant despite major improvements in the accurate diagnosis of peptic ulcer disease and the use of H_2-receptor antagonist drugs and other pharmacologic agents. The mortality rate from bleeding ulcers has averaged between 6% and 10% during the past 30 years despite advances in diagnosis and treatment.

During the past decade, there has been a remarkable transition of the application of the endoscope from solely a diagnostic tool to a therapeutic modality. With the advent of this therapeutic role, there has been much enthusiasm about using endoscopic techniques in managing high-risk patients. A variety of approaches for endoscopic management of bleeding have evolved and there has been continuing improvement over the past decade, resulting in considerable interest in evaluating the various treatment options for managing patients with bleeding ulcers. Unfortunately, there have been limited and conflicting clinical studies on the efficacy and safety of the various hemostatic modalities available for treating these ulcers. In an effort to define the role of these methods, the National Institute of Diabetes and Digestive and Kidney Diseases and the Office of Medical Applications of Research of the National Institutes of Health sponsored a Consensus Development Conference on therapeutic endoscopy and bleeding ulcers. The conference brought together research clinicians and other health professionals and representatives of the public on March 6 through 8, 1989. Following two days of presentations and discussion by the invited experts and the audience, members of a consensus panel drawn from the health care and medical communities weighed the scientific evidence in formulating a statement in response to several questions:

1. Which patients with bleeding ulcers are at risk for rebleeding and thus emergency surgery?
2. How effective is endoscopic hemostatic therapy?
3. How safe is endoscopic hemostatic therapy?
4. Which bleeding patients should be treated?
5. What further research is required?

It is important that certain limitations be considered when applying the findings of this conference to a particular bleeding patient. The conference was charged to address specifically the question of therapeutic endoscopy for the treatment of bleeding peptic ulcer. Other causes of upper gastrointestinal bleeding, including gastric and esophageal varices, diffuse erosive gastritis, and Mallory-Weiss tears, were necessarily excluded from consideration. It should be noted that the conclusions reached should not be extrapolated to those diseases excluded from consideration. Moreover, a striking finding from the review of available clinical trials of therapeutic endoscopy was the selective inclusion of only a small proportion (10% to 25%) of the total population of

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NIH Consensus Development Conferences are convened to evaluate available scientific information and to resolve safety and efficacy issues related to a biomedical technology. The resultant NIH Consensus Statements are intended to advance understanding of the technology or issue in question and to be useful to health professionals and the public.

NIH Consensus Statements are prepared by a nonadvocacy, nonfederal panel of experts based on (1) presentations by investigators working in areas relevant to the consensus questions during a 1½-day public session; (2) questions and statments from consensus attendees during open discussion periods that are part of the public session; and (3) closed deliberations by the panel during the remainder of the second day and the morning of the third day. This statement is an independent report of the panel and is not a policy statement of the NIH or the federal government.

From the Office of Medical Applications of Research, National Institutes of Health, Bethesda, Md.

Reprint requests to Office of Medical Applications of Research, Bldg 1, Room 260, National Institutes of Health, Bethesda, MD 20892 (William H. Hall). Bibliography, prepared by the National Library of Medicine, is available from the same address.

patients who presented with upper gastrointestinal bleeding. In addition to patients with the above diagnosis, many other patients were also excluded, quite appropriately, owing to hemorrhage too massive or too little to justify prudent therapeutic endoscopy.

In this conference, the need for *emergency* surgery was taken as one indicator of inadequately controlled bleeding. Although many patients treated with surgery do well, they are subjected to additional discomfort and cost and to approximately a 10% risk of mortality when the surgery must be performed under such emergency conditions. On the other hand, when temporary hemostasis achieved by endoscopic therapy allows resuscitation and hemodynamic control of a patient whose condition is unstable, considerable benefit may be realized even if surgery must be performed ultimately. For a variety of reasons, a surgeon should be involved from the outset in the team caring for the patient with bleeding peptic ulcer.

1. Which Patients With Bleeding Ulcers Are at Risk for Rebleeding and Thus Emergency Surgery?—Both clinical and endoscopic features are predictive:

Clinical Features

Magnitude of Bleeding.—There is consensus that a major predictor of significant persistent or recurrent bleeding is the magnitude of blood loss before initial evaluation. Clear indications of a large and clinically significant volume of blood loss are hemodynamic instability, hematemesis of grossly red material, or red stool. The hazard of hemodynamic instability underlies the importance of careful hemodynamic evaluation to detect significant hypovolemia before the appearance of overt shock. Another commonly used indicator of the magnitude of hemorrhage is estimation of the volume of blood lost, often quantitated as the number of units transfused or as a transfusion rate. Although there is general agreement that the volume of blood loss is important, there is substantial uncertainty about the best way to estimate it. Persistent red blood in the nasogastric aspirate correlates with an increased requirement for subsequent transfusion. Although failure of the nasogastric aspirate to clear with irrigation often is taken as an indication of rapid bleeding, this criterion may be misleading.

Host Factors—Patient-related factors also predict persistent or recurrent bleeding. The panel finds that documented coagulopathy and the onset of bleeding in a patient already hospitalized for a related or unrelated condition are predictive of recurrent bleeding. Two other factors, age and the existence of concurrent illnesses, while clearly related to mortality, bear a less clear relationship to prognosis for continued bleeding or rebleeding.

Endoscopic Features

The first and most important endoscopic predictor of persistent or recurrent bleeding is active bleeding at the time of endoscopy, as evidenced by arterial spurting or oozing. Also of importance is the presence of a discrete protuberance within the ulcer crater, often referred to by endoscopists as a "visible vessel" or "sentinel clot." There is consensus that some pigmented protuberances (red, blue, or purple) imply a high risk of rebleeding, even when not associated with bleeding at the time of endoscopy. There is less agreement on the prognostic significance of a white or black protuberance. A white protuberance may be indicative of an older, more organized process. Although any such lesions often are referred to as visible vessels, pathological studies indicate that only some are true vessels. Most frequently, they represent a hemostatic plug (clot) in the underlying vessel or a false aneurysm. The prognostic implications of these distinctions remain unclear. An additional endoscopic predictor of recurrent bleeding is the presence of a clot that adheres to the ulcer base despite gentle washing (adherent clot).

Whereas the anatomic location of the ulcer crater often is cited as a prognostic factor, the panel members do not agree that site is clearly predictive. Nevertheless, many endoscopists feel that deep ulcers located high on the lesser curvature of the stomach or in the posterior-inferior wall of the duodenal bulb are at greater risk for severe bleeding owing to their proximity to large vessels.

Features that clearly appear to be associated with a low frequency of recurrent bleeding include a clean ulcer base or one that contains a flat pigmented spot indicative of old hemorrhage.

Value of Combined Clinical and Endoscopic Predictors

Whereas the above clinical and endoscopic features are predictive when considered singly, they may become particularly useful as prognostic indicators when considered together.

2. How Effective is Endoscopic Hemostatic Therapy? — The following consensus statements on the effectiveness of the various endoscopic hemostatic therapies are based on the limited number of studies performed. Results were reported only for the acute hospital stay; only sparse follow-up data are available. The level of efficacy of individual treatment modalities varies from study to study. Some factors that may account for this variability are small sample sizes, variation in patient characteristics such as age, entry criteria, differing definitions of such terms as *visible vessor* or *rebleed,* and timing of endoscopy. Nonetheless, certain conclusions can be drawn from these studies.

Most Promising Techniques

Multipolar Electrocoagulation.— Multipolar (also known as bipolar) electrocoagulation appears to be an effective modality for achieving immediate hemostasis and preventing rebleeding in actively bleeding patients and patients with visible vessels. The data are less clear that multipolar electrocoagulation decreases the need for emergency surgical intervention or decreases mortality.

Further advantages of this modality are that it does not require an *en face* approach to the bleeding point, the endoscopist can control the depth of tissue injury, and the equipment is portable and easy to use.

Recommendations are evolving concerning technique in terms of probe size, power setting, pressure applied, and duration and number of pulses delivered.

Heater Probe.—In comparison with conventional medical therapy, the heater probe appears to achieve immediate hemostasis and to reduce rebleeding and the need for emergency surgery. The advantages of heater probe therapy are the same as for multipolar electrocoagulation.

Early data for multipolar electrocoagulation and the heater probe suggest no delay in ulcer healing in treated patients.

Other Techniques

Neodymium:Yttrium-Aluminum-Garnet Laser.—The neodymium:yttrium-aluminum-garnet laser appears to be effective for achieving immediate hemostasis and preventing rebleeding. Studies have also shown a trend toward reducing need for emergency surgery and lowering mortality. Difficulties in using this instrument include gaining access to the bleeding lesion for an *en face* approach and training endoscopists in its use. Laser therapy is difficult to master and apply. Furthermore, the neodymium:yttrium-aluminum-garnet laser is costly to use in relation to other modalities. Although portability has been an obstacle to its use, new portable instrumentation is now available.

Injection Therapy.—Some agents (eg, sodium chloride, epinephrine, and ethanol) appear promising for early control of bleeding. Currently, there are insufficient data to make specific recommendations concerning the proper role of this approach. However, injection therapies warrant further study because of their technical ease of use, low cost, and promise.

Techniques Not Recommended

Topical.—There is no current evidence for efficacy of the following agents: cyanoacrylate glue, clotting factors, ferromagnetic tamponade, epinephrine lavage, and microcrystalline collagen hemostat.

Argon Laser.—This technique appears to be effective for immediate hemostasis, but available data do not demonstrate significant reduction in rebleeding, mortality, or need for emergency surgery.

Monopolar/Electrohydrothermal Coagulation.—This modality appears to be effective for immediate hemostasis. However, monopolar therapy has been replaced by other techniques because of difficulty in its use owing to the necessity to meet the bleeding point *en face* and to control the depth of injury and the need for multiple cleanings of the probe.

3. How Safe Is Endoscopic Hemostatic Therapy?—Safety may be compromised by the following:

- Patient characteristics: hemodynamic instability and associated illnesses.
- Ulcer characteristics: depth and location, especially posterior-inferior duodenal bulb and high lesser curvature of the stomach because of the proximity to large arteries.
- Method of therapy: excessive depth of penetration of energy or injectant.

The consensus of the panel is that therapeutic endoscopy should be performed only by an endoscopist experienced and qualifed in the specific therapeutic techniques. Appropriate professional organizations should develop guidelines for training and for quality assurance.

The goal of endoscopic hemostatic treatment is to stop active bleeding and prevent rebleeding while controlling depth of tissue injury and avoiding excessive necrosis, increased bleeding, and perforation. The only indication to remove an adherent clot other than by low-pressure irrigation is in the actively bleeding patient or the patient who has rebled. After clot removal, the endoscopist must be prepared to apply therapy.

The risk of precipitating bleeding with therapy is variable but has been as high as 20%. While this bleeding can usually be controlled by the same endoscopic hemostatic therapy, occasionally uncontrollable bleeding will require emergency surgical intervention. The risk of perforation has been approximately 1% and may require laparotomy should it occur.

In the patient population at high risk of rebleeding, the rate of complications of endoscopic hemostatic therapy appears to be acceptably low considering the natural history of the disease.

As the technology in this field advances, controlled observations of potential complications are needed to ensure that safety remains within acceptable limits.

4. Which Bleeding Patients Should Be Treated?—Acute peptic ulcer bleeding will stop spontaneously in approximately 70% to 80% of patients. Therefore, there is consensus that a need exists for selectivity in applying endoscopic hemostatic therapy to bleeding ulcers. Such therapy should be directed at selected high-risk patients.

A clinical feature of high risk for rebleeding or death is rapid bleeding with substantial blood loss manifested by hemodynamic instability, ongoing transfusion requirement, red hematemesis, or red stool. Other patient characteristics that predict a poor outcome from ulcer bleeding include age greater than 60 years and major associated diseases. Patients whose onset of bleeding occurs in the hospital or who rebleed during hospitalization are also at high risk.

Patients with high-risk clinical features are candidates for therapeutic/hemostatic endoscopy. The observations at endoscopy should then determine whether endoscopic hemostatic therapy should be carried out. There is consensus that the findings of pulsatile bleeding (spurting) or oozing from the ulcer are indications for treatment. In addition, the finding of a pigmented protuberance (visible vessel or sentinel clot) in the ulcer crater is an indication for endoscopic hemostatic therapy.

There is agreement that patients with ulcer craters that are clean with or without flat pigmented spots do not require endoscopic hemostatic treatment.

In the absence of the clinical risk factors described above, adherent clots (resisting gentle washing) without evident active bleeding should *not* be removed because of the possible risk of precipitating bleeding. In a deteriorating clinical situation, adherent clots may be removed as long as there is satisfactory endoscopic access and capability for treatment. Surgical backup should be readily available to deal with the possibility of precipitating active bleeding that cannot be controlled endoscopically, and thus the need for early surgical consultation.

Patients exsanguinating with torrential bleeding from peptic ulcer represent a special case. The panel agrees that endoscopic localization and treatment should be attempted in concert with the surgeon and without undue delay.

Deep ulcers near the left gastric artery high on the lesser curvature of the stomach and those near the gastroduodenal artery in the posterior-inferior duodenal bulb may be at high risk for major bleeding. Surgical support must be available before endoscopic treatment of ulcers in these anatomic locations is undertaken.

It is important to resuscitate patients and correct coagulopathy as completely as possible before endoscopic hemostatic therapy. Uncontrollable coagulopathy appears to be a contraindication to endoscopic hemostatic therapy in the patient who is not actively bleeding. However, in the patient who is actively bleeding, endoscopic hemostatic therapy may be attempted despite uncorrectable coagulopathy, with the awareness that control of hemorrhage may be temporary.

Endoscopic treatment of patients with bleeding peptic ulcers should be carried out only by individuals qualified in therapeutic endoscopy.

5. What Furthur Research is Required?—Despite the considerable technical advances that have been made in the past decade in endoscopic hemostatic therapy, firm conclusions regarding clinical applications are limited by a paucity of controlled trials. There is consensus that a number of important issues remain to be resolved and that high priority should be given to continuing scientific evaluation of techniques. There is a strong need to use rigorous scientific methods to resolve the following issues:

- Standardize use of teminology, particularly descriptive terms such as *visible vessel* (eg, white, blue, red, black, or bare), *adherent clot,* and *persistent and recurrent bleeding.*
- Quantitate rebleeding risk associated with endoscopic features such as visible vessel; adherent clot; size, depth, and location of ulcer; and timing of endoscopy.
- Quantitate rebleeding risk associated with different host factors such as aging, nonsteroidal anti-inflammatory drug use (including aspirin), and associated diseases.
- Develop a composite system using clinical and endoscopic features to predict risk of persistent or recurrent bleeding.
- Define optimal treatment regimens for individual and combined treatment modalities to maximize therapeutic effectiveness.
- Explore improved diagnostic and therapeutic technology through collaboration with bioengineers.

Clinical effectiveness and safety of endoscopic hemostatic therapies would be best assessed by multicenter, randomized, controlled trials. Ulcer patients at high risk but without active bleeding at endoscopy should be entered into studies comparing endoscopic therapies with medical therapies. There is a lack of consensus regarding the need for a medical therapy control group of patients with active bleeding at endoscopy.

Conclusions and Recommendations

- In the United States, more than 100 000 patients a year bleed from peptic ulcers.
- Despite advances in diagnosis and treatment, the mortality rate from bleeding ulcers has remained largely unchanged, averaging between 6% and 10% during the past 30 years.
- Bleeding from peptic ulcers will stop spontaneously in 70% to 80% of patients.
- A surgeon should be involved from the outset in the team caring for the patient with a bleeding peptic ulcer.
- Patients at high risk for persistent or recurrent bleeding are those with a large initial blood loss and active bleeding or a pigmented protuberance (visible vessel) at endoscopy.
- Patients at low risk for subsequent bleeding are those with a clean ulcer base or one that contains a flat pigmented spot at endoscopy.
- The heater probe and multipolar (also known as bipolar) electrocoagulation are the most promising modalities for endoscopic hemostatic therapy.
- In the hands of the qualified therapeutic endoscopist, the rate of complications of endoscopic hemostatic therapy is acceptably low considering the natural history of bleeding peptic ulcers.
- Endoscopic hemostatic therapy should be used only in patients who are at high risk for persistent or recurrent bleeding and death.
- Clinical efficacy and safety of endoscopic hemostatic therapy should be assessed by multicenter, randomized, controlled trials.

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Speakers were:

J. Loren Pitcher, MD: "Therapeutic Endoscopy and Bleeding Ulcers: A Historical Overview"

David A. Gilbert, MD: "Epidemiology of Upper Gastrointestinal Bleeding"

Walter L. Peterson, MD: "Clinical Risk Factors"

James H. Johnston, MD: "Endoscopic Risk Factors"

C. Paul Swain, MD: "Pathophysiology of the Bleeding Lesions"

Walter L. Peterson, MD: "Efficacy Criteria—Outcome of Therapy"

Fred Silverstein, MD: "Introduction to Therapeutic Intervention in Peptic Ulcer Bleeding"

C. Paul Swain, MD: "YAG Laser: The Pro Approach"

Guenter J. Krejs, MD: "YAG Laser: The Con Approach"

Peter B. Cotton, MD, FRCP: "Argon Laser/ CO_2 Treatment of Bleeding Ulcers"

John P. Papp, MD: "Monopolar and Electrohydrothermal Treatment of Upper Gastrointestinal Bleeding"

Loren Laine, MD: "Bipolar/ Multipolar Electrocoagulation"

Dennis M. Jensen, MD: "Heater Probe for Hemostasis of Ulcers"

Choichi Sugawa, MD: "Injection Therapy"

David A. Peura, MD: "Topical Therapy for the Control of Gastrointestinal Bleeding"

Stanley B. Benjamin, MD: "Therapeutic Endoscopy and Bleeding Ulcers: Methodology"

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The conference was sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases, Phillip Gorden, MD, Director; and the Office of Medical Applications of Research, John H. Ferguson, MD, Director.

Study of the Canadian Health Care System

AMA BOARD OF TRUSTEES

RESOLUTION 48 (I-88), which was adopted by the AMA House of Delegates, calls for a study of the adoption of major technology advances in Canada and the U.S. Resolution 124 (A-88), which was referred to the Board of Trustees, requested a study of the Canadian health care system with identification of its advantages and disadvantages. This report responds to both requested studies of Canadian health care.

Information for this report was assembled from a variety of published materials, and from staff communication with individuals representing Canadian hospitals, medical societies, voluntary organizations, and federal statistical agencies.

I. Introduction to the Canadian Health System

In Canada, public policy toward health care has been shaped by its wider need to establish a separate cultural identity while sharing in the general advances of English-speaking societies. Canada and Britain severed their last formal constitutional links in 1982. Canada's strains are related to the fact that it is a sparsely populated country spread across a wide geographic area in close proximity to the U.S. Canada's problems of identity are also related to the fact that it is populated by immigrants from many nations, and with two main contenders for cultural dominance—English- and French-speaking Canadians. These social forces have led Canada to evolve unique responses to basic health care issues.

From the point of view of current U.S. health policy, the most important response is that Canada places no direct economic burdens on the users of health care. All responsibility for health care payment is placed on government. *As a result, the link between who pays the bills and who receives the services is completely broken.* The price to consumers at the time their decisions regarding health care are made is effectively zero. This is a structural defect which leads directly to an excessive demand for services, and will be a growing source of conflict between government and consumers. As a matter of principle, the Canadian health care system is a poor model for the U.S. to emulate, both because of Canada's distinctive cultural values and traditions and because of the absence of any direct economic involvement of patients in health care.

Canada's health system is characterized by joint federal-provincial financing of public payment, and reflects governments' commitments to expenditure constraints at the expense of other goals. The economic recession of the early 1980s meant that, in most of Canada's ten provinces, acute care hospitals were placed under firm budget restrictions. As a result, chronic care beds are now in short supply, and waiting lists for inpatient and outpatient services have lengthened. In general terms, budgetary constraints on health care expenditures have shown up as:

- physical quotas, such as contraction of or limits on the expansion of the number of hospital beds, restrictions on the number of physicians, and controls on the diffusion of medical technology;
- tight squeezes on physician fee schedules, hospital budgets, and drug prices; and
- general price controls applied to the health sector differentially relative to the rest of the economy as a result of governments' anti-inflation strategy.

Since the 1970s, the Canadian health care system has reduced growth in national health care expenditures largely through its national-provincial health insurance funding arrangements. Provincial governments decide, with minor exceptions, what the level of spending on medical and hospital care will be in the respective provinces. Because of the absence of private insurance for the bulk of hospital and physician expenditures, the provincial authorities are, in effect, single paymasters. Generally speaking, Canada has pursued budgetary objectives along four policy lines:

- global prospective hospital budgeting;
- rationing of the number of hospital beds and the diffusion of medical technologies;
- exploitation of monopsony power in negotiating fees with physicians; and
- control over the number of health care industry employees and practitioners.

This report of the AMA Board of Trustees was adopted by the House of Delegates at the 1989 AMA Annual Meeting.

II. Investment in Capital and Technology

A. Capital Investment

Hospital expenditures have been constrained through global budgeting. Canadian hospitals receive increases in total operating budgets each year determined partly in relation to stated requirements, but also partly in relation to the rate of inflation and in relation to the provincial governments' fiscal positions. The inevitable problem with a policy directed at budget control without consideration of distributing resources and outputs to competing demands is the unplanned adjustments to scarcity produced in the system. In the Canadian case, stringent budgetary controls have been reflected mainly in a deteriorating capital structure.

Real capital expenditures, or the inflation-adjusted quantity of capital spending per capita, increased at an overall average rate of 2.7% per year from 1975 to 1988. However, since 1982 the increase in capital expenditures can be explained entirely by inflation. *Real capital expenditures fell .01% from 1982 to 1988.*

Current provincial government policies have a general orientation toward attempting to cut back on capital spending. Tight capital budgets in Canada tend to preserve a hospital-oriented system, which is becoming increasingly antiquated, at the expense of less expensive delivery sites. Canada is not taking advantage of efficiency improvements, such as ambulatory care programs and various special care institutions, because of reluctance to make the initial capital investments. *This is a short-sighted approach which produces long-term deterioration, and is likely to result in more expensive care overall.*

B. Medical Technology Adoption

Technological developments in medicine are generating a steady stream of innovations which are on balance more effective but are also superficially more expensive. The progress of technology and the difficulty the system imposes on providers who try to obtain it has worsened the Canadian capital investment problem. Retarded diffusion of certain technologies has a deteremental impact on:

- the efficiency of health care; and
- the quality of services delivered.

Thus, delay in implementing appropriate new technology may endanger lives and forego possible cost savings.

The problem can be illustrated by comparison to the U.S. The difficulty in developing information in this area is that medical technology diffusion in Canada is not documented systematically. Little information is available on the number and distribution of technologies in Canadian hospitals, because capital and operating budgets are separated and global budgets do not detail individual types of services. Some information is available, however, which is discussed below.

Table 1
Comparative Availability of Selected Medical Technologies

	CANADA (1988)		*UNITED STATES (1987)*	
	Number of Units	*Inhabitants Per Unit (1000)*	*Number of Units*	*Inhabitants Per Unit (1000)*
Open Heart Surgery	11	2364	793	307
Cardiac Catheterization	31	839	1234	198
Organ Transplantation	14	1857	319	764
Radiation Therapy	31	839	967	252
Extracorporeal Shock Wave Lithotripsy	4	6500	228	1069
Magnetic Resonance Imaging	12	2167	900	271

Sources: American Hospital Association. HOSPITAL STATISTICS, 1988.
Canadian Hospital Association, Ottawa, Ontario
Canadian Association of Radiation Oncology, Vancouver, British Columbia.
University Hospital, London, Ontario.
Canadian Medical Association, Ottawa, Ontario.

Table 1 compares the availability of six technologies between Canada and the U.S. that have wide medical applicability, yet involve high capital and operating costs and thus have been the target of explicit control policies by provincial governments. The technologies were selected for study because they were the only technologies for which comparative data could be obtained. The data are from multiple sources. Canadian figures are for 1988 and U.S. figures are for 1987.

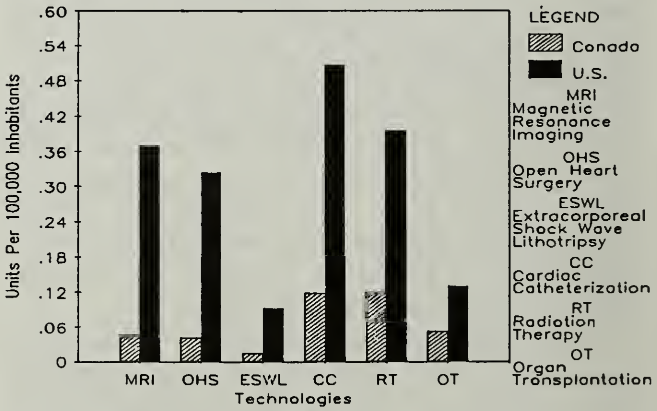


Figure 1
Selected medical technologies per capita: Canada and the U.S.

Figure 1 presents the number of sites (hospitals, ambulatory centers, and other sites) which utilize the technologies in each country and, to adjust for population differences, the number of inhabitants per unit. *The data indicate wide differences between countries in the availability of all studied technologies.* Although the ideal ratios of inhabitants to units of specific technologies are not definable, the consistently lower availability of technology in Canada strongly suggests that factors other than variations in practice patterns are playing an important role.

Per capita comparisons are also depicted graphically in Figure 1. Key comparisons include:

- nearly eight times more magnetic resonance imaging and open heart surgery units per capita in the U.S. than in Canada;
- over six times more extracorporeal shock wave lithotripsy units per capita in the U.S.; and
- four, three, and two times more cardiac catheterization, radiation therapy, and organ transplantation units per capita respectively in the U.S.

These data suggest an ambiguity to claims that Canada offers universal access to high-quality medical care. Canada is apparently not expanding spending on health care to meet its growing technological and capital needs. "Universal access" in Canada has come to mean an ever more obsolete and inadequate range of services in comparison to what the advance of knowledge and technique is making possible.

III. Hospital Rationing and Access to Care

In the context of universal and "free" health care, Canada uses queues and other types of rationing to constrain demand and stabilize costs. The stability of costs in Canada appears to be associated with declining standards and accumulating unmet needs. Across the provinces:

- Waiting lists for most postponable surgery are commonplace.
- Cardiac bypass, hip replacement, and cataract operations are routinely triaged.
- In Vancouver, the wait for a psychiatric, neurosurgical, or routine orthopedic opinion is one to three months, six to nine months for cataract extraction, two to four years for corneal transplantation, and six to 18 months for admission to a long-term placement bed.
- Migration of Canadian patients to U.S. health care facilities is commonplace.

Increased demand for cardiological services, combined with bed closures and government restraints on medical manpower, are resulting in lengthening waiting lists for coronary angiograms, heart surgery, and other cardiac-related procedures. During January 1989:

- many waiting lists in Quebec for angiograms were six months long;
- the wait for coronary artery bypass surgery in Quebec was eight to nine months;
- more than 1,000 people were on waiting lists for bypass surgery in Toronto; and
- at Toronto's Hospital for Sick Children, 40 children ranging in age from one to 15 had open heart surgery cancelled and faced a delay of up to eight months for their surgery.

Quebec hospitals routinely close beds during the winter months to ensure that their budgets balance. Since fiscal years end on 31 March, hospitals facing possible budget deficits and Quebec government directives ordering them to keep their budgets balanced have little choice but to close beds. For instance:

- Over the winter months of 1988-89, 633 beds were closed in the greater Montreal area, 125 more than in the previous year.
- An average of 700 chronic care beds are closed in the province during the year.
- During December 1988, about 500 acute care beds were occupied by chronic care patients.

The lengthening of waiting lists to avoid budget deficits is also beginning to occur in Ontario.

Overcrowding has been a problem in Canadian emergency rooms for some time. Because of insufficient numbers of intensive care nurses and a lack of beds to which hospitals can transfer emergency patients, Toronto, Montreal, and Vancouver emergency rooms often have no capacity to handle new patients. In Toronto, the situation can be attributed to the closure of 1,100 hospital beds between January and March 1989. In Montreal, the problem concerns the slow progress in adding new acute care and chronic care beds and the fact that hospital beds are closed to balance budgets. In Montreal:

- the occupancy rate of emergency rooms at midnight averages 104% of stated capacity;
- 39% have occupancy rates above 115%; and
- many hospitals keep patients in emergency departments for longer than 48 hours.

Although Canadians do not pay out-of-pocket for insured services, nonpecuniary costs are imposed upon the patient. This includes not only queues for certain procedures but also a variety of scheduling-related costs associated with long waiting-room times, inconvenient appointment hours, complicated regulations regarding delivery sites, and so forth. In direct response to such impediments, patients have increasingly sought treatment in the U.S.

Taken in combination, these emerging Canadian hospital problems reflect an inability of the present Canadian system to respond to current patient demands. Despite the tendency of some to dismiss patient-generated demands as frivolous and access to advanced medical technology as unnecessary, many Canadians are coming to look more critically at what they perceive as an unnecessarily rigid, unresponsive, and increasingly technically substandard health care system.

IV. Payment for Physician Services

Canadian health policy on physician services is directed toward restrictions on professional autonomy and remuneration methods. Costs for physician services have been constrained mainly through:

- unilateral decisions on fees by provincial departments of health; or
- stringent bargaining by provincial government medicare agencies with provincial medical associations.

Initially, most provinces administered the fee negotiation process with physicians with quasi-public medical care commissions. In recent years, most of these provincial commissions have been eliminated and their functions assumed by the provincial ministries of health. The ministries, if they choose, can unilaterally impose fee settlements. Therefore, in the end, most provinces can determine physician fee on a "take it or leave" basis.

Continuing increases in the number of physicians per capita coupled with restrictions on extra-billing and the number of hospital beds are causing present payment arrangements for physicians to be less and less satisfactory. Traditionally, medical fees in Canada have been viewed as complete payments for medical services, although the fee typically covers only physician time when the service is provided in hospitals and a set of other input costs when the service is provided elsewhere. As long as the distinction between hospital and ambulatory services was clear and as long as most physicians had access to hospital facilities, the payment procedure was viable.

Present trends are making the distinction between hospital and ambulatory services much more murky and are forcing an increasing proportion of physicians, including specialists, to do more of their work outside hospitals. Thus, a fee which appears quite adequate to one physician providing a service in a hospital can simultaneously appear quite inadequate to another physician providing the same service in a clinic or office. As a result, Canadian fee schedules inadequately distinguish between physician payment increases and all other cost increases.

V. The Canadian Health Care System as a Model for the U.S.

American health delivery arrangements provide an interesting contrast to the Canadian system. American health care offers a potential for greater efficiency by pushing prices into line with resource costs, and promotes greater economy by encouraging competition, both in the classical sense of more suppliers of a given type and in the pluralistic sense of more types of arrangements (or modalities) for the provision of care. With respect to pricing, three American initiatives stand out:

- experimentation with the role of user fees and various insurance restrictions on patient-consumer behavior;
- consideration of special pricing arrangements for medical therapies still in the experimental stage; and
- consideration of diagnosis-related grouping arrangements as methods for reimbursing hospitals.

With respect to competition and efforts to foster efficiency, the American health care system has fostered HMOs and PPOs as competitive counterbalances to traditional fee-for-service medicine. It has also incorporated such innovations as:

- free-standing emergency centers;
- corporate and entrepreneurial medical supply arrangements;
- social health maintenance organizations;
- hospices;
- birthing centers; and
- surgicenters.

New methods of payment for health care providers have been introduced and are based on incentives intended to discourage the inefficient use of costly resources. New schemes of private insurance have been introduced to encourage competition. There are also mergers between large enterprises in numbers and on a scale not seen before. *The U.S. health system is experimenting with new approaches to problems while the Canadian system seems frozen by comparison.*

VI. Summary Assessment

In theory, Canadians have an ideal health care system: a comprehensive system of primary care, removal of all financial barriers to access to primary care, decentralization of health programs, and professional standards of care equal to or better than those of most western countries. But in many important ways Canada's system is lacking;

- It is less responsive to consumers than the U.S. system.
- Much of its capital structure is neglected.
- Adoption of major medical technologies lags far behind the U.S.
- There are growing backlogs for a variety of surgical and emergency procedures.
- It does not reward or encourage high performance by providers.
- It is rigid and inflexible.

The Canadian system appears to be poorly suited to postindustrial societies with changing human service needs, and will grow more and more to resemble the British National Health Service with its severely depreciated capital base and explicit rationing of medical care.

The type of complete government-provided health insurance found in Canada lead inexorably to the imposition of government controls over the size and character of the health care system. While costs may be reduced in this manner, the centralized controls required make it an unsatisfactory model to be followed in the U.S.

VII. Recommendation

The Board recommends that this report be adopted in lieu of Resolution 124, (A-88).

Age, Illness, and Psychosocial Integrity

MORTON C. CREDITOR, M.D.

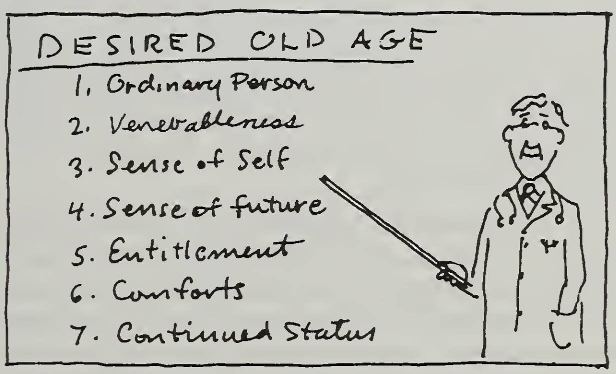
I CONSIDER myself somewhat of an expert on aging, since I have been doing it for about sixty-five years and have spent the last six years as a teacher and practitioner of geriatric medicine. This discourse is a derivative of my becoming a consumer of the service that I purvey. It is directed towards the matter of psychosocial integrity as one ages, particularly if one happens to get sick while aging.

It is enigmatic that the issues of aging are often perceived as the problems of aging. The aging of our population, the fact that almost all of us will get old, many very old, is viewed as a societal *problem*. One would think it would be considered a societal achievement, something to be celebrated. But much of our professional literature, our academic process, our political dialogue, and our legislative processes are devoted to the analysis and solution of *problems* of the aged.

And no wonder. The aged have suddenly appeared in large numbers. Within my own lifetime, the number of people in the United States over age sixty-five has increased from five million to over 25 million; from less than five percent of the total to more than 11 percent. The life expectancy of infants born in 1900 (about two million of whom are still alive) was only forty-nine years. It is now about seventy-nine for a white female infant born in America. These enormous changes have occurred intragenerationally, allowing little time for societal adaptation.

The old folks suddenly appeared like a wave of immigration, and, as with any wave of immigration, you recoil, react, develop biases, invent ethnic jokes, but in this case do not get to enjoy a new wave of ethnic restaurants.

As is the case with any wave of immigrants to be integrated into our society, we must first characterize and define them if we are to develop programs to address their needs. And of course that whole sentence is sort of an oxymoron, because whenever we characterize, whenever we demarcate, whenever we label, particularly for purposes of integration, we set up the marked group for discrimination.



On the other hand, the individual "pseudoimmigrants" have no personal perception of this change, unless their receipt of a Medicare card can be equated to sailing up the bay past the Statue of Liberty. They began to get old the day they were born. They get older every day.

Although this is a continuum in which none of us as individuals can pick out the moment when we are "old," certain societal markers suddenly tag us as being members of the newly arrived immigrant group eligible for special *nurture* whether we need it or not and eligible for certain *treatment* whether we deserve it or not.

I received my "green card" last summer in the form of an irrevocable membership pass that gave me free entry into the national parks. In October I received full citizenship in the form of Medicare eligibility.

I would like to develop my thesis further by speaking about my view of myself as I turned "old." I did not feel any differently about myself on that day than I did last year, ten years ago, or forty years ago, when I graduated from medical school.

My vocational and avocational interests not only continue but continue to expand. I have made two career changes in the past five years, and if I someday decide to retire from full-time employment, I will view that as

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another career that shall further broaden my perspective.

Nor did I allow my age (and the impediment of recent physical relocation some 500 miles distant) to interfere with my continuing twenty-year attendance at the opera in Chicago or my enjoyment of my recently acquired craze for sailing. I continue to run and continue to hate it, but I know it will always be a good thing to do, irrespective of age. The move was from a high-rise apartment to a house on a wooded lot, and my penchant for gardening returned as if never interrupted.

My politics are unchanged, and my anger with political parties, both mine and theirs, continues. My biases, although a little better controlled, linger in the background, and my appreciation of a beautiful girl is no less than in my twenties (although as someone recently explained to me, the saltpeter they fed me in the military during World War II has finally begun to work and is responsible for the altered inclination I might have to act upon the sensory appreciation). My wife also has something to do about that.

Perhaps of greatest significance is my continuing sense of future. Consciously and unconsiously I think about and plan for tomorrow, next weekend, next year, next years. The more I do, the more I learn about more things to do and that I intend to do. I continue to be me. I continue to project the values and aspirations that are the product of all my past experiences. I agree with Claude Pepper, who said recently, "A lot of people get the idea that if you are up in years you are a different person. These so-called elderly people are just ordinary people."[1]

Arthur Miller wrote in his autobiography, "[A]nd now at seventy-two I have to stop myself from thinking like a man of fifty who has plenty of time ahead."[2] This reassures me that at age seventy-two I shall still be planning for my future as I am at age sixty-five. Every time I read about Armand Hammer I know I shall do the same at eighty-six, as long as that future is worth planning for.

I want the opportunity to continue to be me, to be considered as an ordinary person. But I expect something more as I get older. I expect status. I want to be considered venerable, which, according to the dictionary, means worthy of reverence or respect by virtue of dignity, character, position, or *age*. What sounds like an outrageous ego trip will sound less outrageous when you realize that I speak for almost everyone, because almost everyone will become old. There is no acceptable alternative.

We have paid our substantive dues in such forms as social security and contributions to other retirement benefits. We have contributed in the figurative sense to the progress of the world during our generation. Those who follow enjoy the benefits provided by their elders. Each generation rides into the present on the backs of their predecessors.

Karen Davis, in stating the public policy rationale for health care for the aged, included repayment for past contributions to society. She pointed out, "The aged have supported the education and investment in human resources of their children and other members of society. They have forgone consumption to permit the accumulation of capital that serves to improve productivity and the standard of living of today's younger generation. They have contributed as taxpayers to the creation of a social infrastructure, including highways, railbeds, dams, bridges, sewer systems, schools, and hospitals that all serve the younger generation. They have fought in wars to assure freedom for succeeding generations. This debt ...is one rationale for a public policy that repays the aged as a group with programs that assure a decent old age."[3, p. 729]

I have listed some of the things I want and expect. Now let me follow with a list of some of the things I do not want.

I do not want my retirement, whenever it occurs, to result in social regression. I do not want to lower my standard of living. It took me a long time to get here. I have already referred to the expectation that retirement be a career change: a promotion, if anything. I believe this aspiration is shared by almost everyone who gets older. Whatever the status one reaches, one does not wish to regress, regardless of age.

Further, I do not wish to be discriminated against. Nor do I wish to be patronized — to be treated in a condescending manner.

I do not want to be prematurely assigned a clinical career — to be converted from person to patient without compelling reason.

I do not want any entitlement I may have to be considered a charity. I do not want to become the beneficiary of a welfare agency.

I do not want to be considered anything but me.

Let us look at the reality that sets me up for all that I do not wish to be, especially if I have the misfortune to become sick.

As I mentioned above, this year I officially became old, and I use the word *officially* in the literal sense. I became eligible to collect my Social Security. I became eligible for Medicare. I shall be included in the category of old in every demographic breakdown of data from medication usage to occurrence of dementia and incontinence. It is unlikely, however, that I shall ever be considered in polls relating to beer consumption, preferences of clothing style, or sports car purchase.

Becoming old is not the problem. To be old should be a matter of pride. The importance, however, of reaching this particular temporal benchmark is that I suddenly become categorized differently. "Old me" is no longer "the old me." I become a senior citizen — funny we were never called junior citizens, although I know a lot of sophomoric citizens at all ages. Assigning euphemisms like *Senior Citizen* is a common form of patronization.

Those who categorize others, who view others as different, use cute and patronizing terms in place of the words that best define the category. Jews are often referred to as Hebrews by those who believe to be called a Jew is to be offended. Blacks were called everything but Blacks until recently. The old will be referred to as Senior Citizens until everyone becomes comfortable with aging as a natural phenomenon common to most of us, and that to be called old is not to be stigmatized.

As a "Senior Citizen" I am patronized in other ways. I can travel on the subway at reduced fare, go to the movie theater at reduced rates, and enjoy other privileges in deference to my attainment of special status.

Perhaps I should not disparage these altruistic gestures but view them as the symbols of veneration that I claimed earlier as an entitlement. The true rewards, however, of reaching "Senior Citizen" status, of being placed in a special category, are not appreciated until you happen to become a sick "Senior Citizen."

And as you get older the chances of getting sick increase, as do the chances of staying sick. If that happens to me, my chances of remaing the old me become very small indeed. The likelihood increases of experiencing all of those things I do not want. Social regression becomes inevitable largely because medical care in this country is outrageously expensive and increasing in cost at an outrageous rate. Nothing can excuse a 12.5 percent increase in cost in a single year. There is certainly no relationship between annually increasing cost and rates of improved health. Nor can such a one-year increase be blamed on the one-year increase in number of those old people who consume so much health care. Medical care is more expensive than it should be for a number of reasons.

It is more expensive than it should be because of unconstrained application of technique and technology just because it is there. It is a splendid technology. But its excess use is just as representative of the poor practice of medicine as is the withholding of needed care and technology.

The reports in the literature of 20 percent excess and 30 percent questionable placement of pacemakers, the unexplained community differences in rates of surgical operations, similar findings about almost every procedure studied, are just the tip of the iceberg.

Medical care is more expensive than it should be because we are inventing ways to subsidize obsolete components of the health and medical care enterprise, such as the hundreds of empty hospital beds in most of the large communities. Instead of celebrating the closure of hospitals and consolidating resources, we are using Madison Avenue techniques to market ancillary enterprises, many of which have no scientific documentation as to worth, in order to gain that margin of profit to offset the deficits created by empty beds.

Medical care is more expensive than it should be because of the unrestrained increases in liability insurance costs, whoever is at fault.

Medical care is expensive because there is no system of care that rationally allocates resources and minimizes redundancies and because we have convinced ourselves that more is better.

The high and increasing costs of health and medical care have ominous implications for the aged.

Currently, if you are old and sick, it is very likely you will become poor (at least poorer than you were), and very likely poor enough to experience social regression.

For many individuals, reaching sixty-five means assurance, perhaps for the first time, of access to health and medical care. For those at the margins of economic security, Medicare provides the access that may have been previously denied, but in spite of Medicare, an elder with significant health problems can easily become impoverished. Medicare has provided for no preventive services, no social services in the home, limited nursing home coverage, no drugs, dental care, eyeglasses, or hearing aids. Elders now pay more out of pocket for health care than they did before the enactment of Medicare, even after adjustment for change in the value of the dollar. The recently enacted catastrophic coverage will help some. Nonetheless, the part paid by the elder could still catapult him, or more likely her, into social regression or indigency.

Something has to be done about the high cost of medical care, and when it is done, the "Senior Citizens," about whom our former president spoke with the same reverence he reserved for freedom fighters, are the sitting ducks for cost containment. Since they are a special group, a categorized and characterized group, limitations that apply to them alone are discriminatory and indeed can be defined as rationing of care. You, because of your special status, cannot have something that others can. Medicare will cover you costs, but only for certain things.

To be sure, the overuse and misuse of medicine and its technology should be curtailed. The prevailing philosophy that more is better is contrary to the best interests of all, but particularly the aged. The hospital is a dangerous place for old people, and the shorter the stay the better. Too many pacemakers are implanted, and too many diagnostic and therapeutic procedures, which cannot possibly improve the quality of life, are performed. The limitations, however, should be imposed because they are in the best interests of the particular patient, not because of cost or age of the patient.

Indeed, it is in the best interest of everyone (including the aged) that health care costs be contained if they are to be afforded without sacrifice of standard of living. Ideally, in my opinion, this would occur if health and medical care were more rationally applied, if the professions policed themselves. Because that idealistic solution is not likely to be invoked, more leverage shall be necessary. But that leverage shall be discriminatorily applied until this country adopts a policy of universal health care coverage for all, regardless of age or social class, and in which the only discrimination would be on behalf of good care. I again quote Karen Davis, who stated, "The foundation of health policy for the aged must be a health care financing plan encompassing the entire population."[3, p. 741]

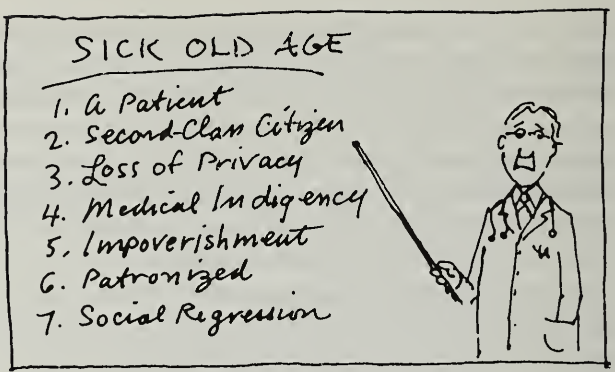
I will now switch gears a bit and speak about a special group of old people and the relationship of their sickness to their continued integrity. In discussing those who are candidates for long-term care, the issues of retaining self, continuing to be me, venerableness, status, and entitlement are particularly cogent.

About five percent of people over sixty-five years and about 20 percent of those over eighty-five reside in nursing homes. At least an equal number with equivalent disability live at home. Old people have about a 20 percent chance of living in a nursing home at some time in their lives.

The contribution of Medicare to nursing home care is trivial, amounting to less than two percent of the total expenditure for such care. For most elders in this country the need for nursing home placement means economic disaster. According to a recent report of the House Aging Committee, as summarized in the *Kansas City Times,* 69 percent of single aged individuals would be financially impoverished after thirteen weeks in a nursing home, and within a year 94 percent would be at the poverty level. About 34 percent of couples would go broke at the end of thirteen weeks and 78 percent in a year.[4] This situation is particularly poignant because most elders (70 percent, according to an American Association of Retired Persons study) believe that Medicare will cover any long-term care needs. In the case of a spouse, the impact of spending down to poverty level is particularly devastating. At least the partner in the nursing home will have his or her basic needs attended to. The newly impoverished spouse often has not much left to live on or to live for. Some states have passed division-of-assets legislation, which will permit the spouse to maintain some semblance of life-style. The recently enacted catastrophic coverage legislation also addresses this issue.

Of course, the newly impoverished candidate for nursing home care becomes eligible for Medicaid support. As a group, the aged comprise 15.6 percent of Medicaid beneficiaries and in 1987 expended 37 percent of the Medicaid dollars. About 50 percent of all nursing home reimbursement is derived from Medicaid.

Medicaid was enacted as a program for poor people. Medicaid is a welfare program. Medicaid is not one's *entitlement* for having become venerable, for having contributed to the world in which one has lived. Medicaid is a charity that makes formerly independent, contributing members of society into second-class citizens. And if you doubt whether they are second-class citizens, ask any nursing home operator whether he would prefer a private-pay to a Medicaid resident or listen to some nursing home operator double-talk when you ask what happens to a resident who runs out of money.



I believe the worst indignity of all would be for me to have, as my ultimate reward, entry into the welfare society. A recent Brookings Institution study, coauthored by Alice M. Rivlin and Joshua M. Weiner, was reported in the *New York Times.* It concludes that " 'long-term care is a normal, insurable risk for the elderly, which should be covered under a general social insurance program,' not through a welfare program."[5] It goes on to say, " 'There is no cogent rationale other than historical accident' to explain why Government support for long-term care is now treated as a public charity, while elderly people are entitled to coverage of physician and hospital care 'without stigma of a means test.' An affluent society should not require people to impoverish themselves to qualify for Government assistance with the costs of long-term care."[5]

The same position was taken in a medical journal editorial: "It is one of the great injustices of the present system that a poor man, hopelessly incapacitated, should be legally classified as a pauper."[6] That statement was written in 1906.

Furthermore, in my opinion, the nursing home in America is an inappropriate institutional form. In its attempt to address a spectrum of need, the nursing home does a poor job in meeting the particular needs of many of its clients. As Bruce C. Vladeck pointed out, "We expect nursing homes...to house and provide social support for frail old people with nowhere else to go; to provide sophisticated rehabilitation services...; to monitor complex and delicate medical conditions; and to care for the demented and psychotic."[7] They cannot do all of these things under one roof. He cites evidence that from 10 to 40 percent of nursing home residents are inappropriately placed.

Robert L. Kane and Rosalie A. Kane pointed out that in "the United States today, the nursing home has become the symbol of the inadequacy of the health system to meet the needs of the elderly," and that a "large proportion of individuals found in nursing homes in the United States would in other countries be served in old-age homes under social service auspices."[8]

The nursing home is not a home, because it functions according to the rules of the clinical paradigm — the health care institution — the hospital. Nursing home placement means consignment to a clinical career and loss of privacy and autonomy. The person becomes a patient, whose life is now governed by orders. On the other hand, for truly sick residents, the clinical services and resources may be inadequate to serve their needs. To be sure, they do not need the services of the acute hospital, which may be better defined as a large intensive care unit. Their chronic illnesses require that they be in the mainstream of medical care, such as a chronic disease facility under the jurisdiction of the health care sector of the economy, not that of the welfare agency.

It is bad enough that we are now so heavily invested in an inappropriate institutional form. It is estimated that if current usage continues the number of nursing home beds, will increase from the current 1.4 million to over three million by the year 2030. I know of no plan to prevent the proliferation of this institutional form, which, with rare exception, everyone views as being undesirable, and which neither I nor anybody else wants to enter.

I have tried to make the point, using personal biography as reference, that growing old is part of the continuum of human development. It is a further projection of an established, but highly individualized, trajectory. No common marker can be identified that could possibly predict the final thrust of all trajectories. No particular age can identify all those who should be uniformly classified, however altruistic the intent.

The attainment of old age by the majority should be viewed as an achievement that should be worthy of celebration. If, however, you are over sixty-five and sick, regression from the pinnacle of achievement is likely to be steep and swift. It is likely to produce suffering far greater than that which results from illness alone.

Social regression will replace comfort and veneration. Old me and the old you are likely to be patronized, prematurely assigned a clinical career, relegated to poverty status, and made a member of the welfare society.

Because most of us will live to be between seventy-nine and ninety-two year old, and because many of us will have varying degrees of disability and be sick, it is in our own best interest that there be a single system of health and medical care. If it is a tiered system, all of us, not just those anonymous poor folk in the other neighborhood, will be discriminated against. We shall be the immigrants. We shall be the minority.

Notice, I said system and not financing plan, because if it is not systematized, it will not be rational and therefore not affordable, and we shall continue to be the identified targets of rationing and in any case suffer social regression.

Furthermore, for that very large percentage of us who will need long-term care, we had better make sure that our options will be such that we can continue to have a sense of future and can look forward to tomorrow and the next day.

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THE MEDICAL LETTER

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TRAINING, CALIBRATION AND CONTROLS — A short period of training in pipetting and instrument operation is essential for optimal results (M Rohac et al, *J Clin Chem Clin Biochem,* 26:39, 1988; PMG Broughton et l, *Br Med J,* 298:297, 1989). Even though each strip carries codes for automatic calibration, controls must be run routinely for each type of test. A reflectance control strip is provided for checking the instrument.

COMPARISON WITH *EKTACHEM* — The *Ektachem* (Kodak) desk-top system (*Medical Letter*, 30:119, 1988) also uses dry-chemistry methods, except for electrolytes, which are not available with the *Reflotron.* One advantage of the *Ektachem* is that a large number of slides can be processed in a short time; with the *Reflotron* strips, the operator has to insert each strip individually, wait for the results, and remove the strip before the next strip can be introduced. The *Ektachem* provides a greater variety of analyses, including HDL-cholesterol, but the *Reflotron*, unlike the *Ektachem,* can analyze whole blood. Some studies have found the *Ektachem* more precise for determining cholesterol and triglycerides, but results with the *Reflotron* have generally been acceptable for clinical purposes (JJ Burke, II and PM Fischer, *JAMA* 259:3444, 1988).

COST — In the USA, the suggested list price for the *Reflotron* is $4,995 compared to $8,350 for the *Ektachem System DT60* and *DTSC. Reflotron* test strips cost $1.23 to $1.87 each, compared to $1.25 to $2.10 for comparable *Ektachem* slides.

CONCLUSION — For the office with a small volume and limited variety of tests, the *Reflotron* provides a reasonably accurate clinical chemistry system, which can use whole blood, eliminating the need for a centrifuge. Personnel must be adequately trained and controls must be run routinely.

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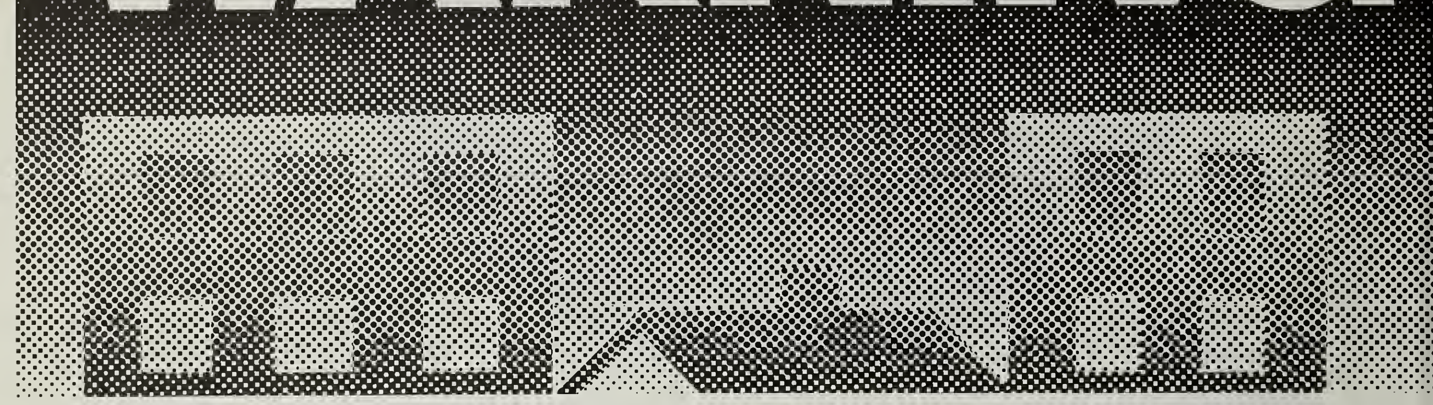

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Impressions—AMA Meeting 3-6 December 1989

The AMA House of Delegates met in Honolulu, 3-6 December 1989. The setting for the meeting was just beautiful. The agenda was noteworthy in its heavy emphasis on health care issues. But, perhaps, most impressive was the attendance and attentiveness of the 435 delegates at the many sessions despite the recreational temptations surrounding us.

A major issue of concern to many of the delegates was addressed at the opening session by James E. Sammons, M.D., Executive Vice-President. A Chicago newspaper had reported two payments to AMA executives authorized by Dr. Sammons who had not followed customary procedure in informing the Board. He admitted the errors and endorsed a long list of recommendations which had been approved by the Board after a thorough investigation of these matters by outside legal counsel. On the following day Dr. Sammons responded well to an array of questions before an overflow crowd at the Reference Committee hearing. Subsequently, the House voted to approve the Board action which, in essence, will strengthen the Board oversight of the Association and define limitations on the authority of the Executive Vice-President especially in financial matters.

The delegates at the opening session heard a fine address by President Alan R. Nelson, M.D., who listed the many signficant achievements of the AMA. Lauro F. Cavazos, Ph.D., United States Secretary of Education, in his presentation asked for our help in improving education. He proposed a major restructuring of our educational system to provide early childhood education, safe, drug free schools, and support for teachers from physician volunteers.

In the Reference Committees and on the floor of the House of Delegates there was little discussion about the "business side of practice." There seemed to be a reluctance to talk more about mandatory assignment, malpractice, peer review organizations (PRO), or the Resource Based Relative Value Scale (RBRVS) although we learned a new acronym MVPS (Medicare Volume Performance Standards). Alas, all these years we thought MVP had some relationship with athletic performance. Exactly what this new MVPS means to all of us is not entirely clear but is a compromise, designed in Washington, to defeat expenditure targets (ETs).

AIDS, appropriately, was a major focus of attention. The House approved a resolution to encourage state legislation to establish requirements for reporting and case follow up for serious contagious disease, including HIV infection. A major policy position on AIDS and HIV infection presented by the Board was approved. Among its provisions are a recommendation for contact tracing and notification of needle partners, endorsement of institutional indemnification of medical students and residents infected as a result of patient contact, commitment to mandatory testing of prison inmates and of all newborns in high prevalence areas, and cooperation with other agencies in combatting this epidemic in all reasonable ways.

Substance abuse was recognized as the nation's major health problem and declared our number one public health priority in a resolution adopted by the House. During rather prolonged discussion the many aspects of substance abuse were enumerated and the importance of a multifaceted approach to it was emphasized. A report from the Board recommended continued cooperation with other involved organizations, increased education and research, development of model alcohol and drug treatment programs, and special efforts to detect these problems in pregnant women and those of childbearing age. In a related action the House passed a resolution to encourage the states to adopt a blood alcohol level of 0.05 percent as illegal for driving.

Many other health care concerns were discussed. Significantly, with the problems of AIDS and substance abuse the AMA has established more active policies. It was a most productive meeting.

Roger S. Beck, M.D.
President

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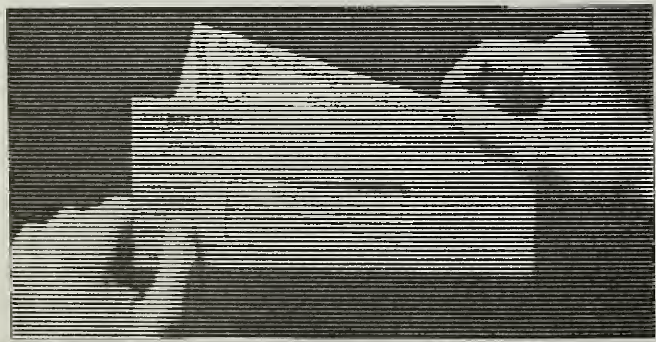

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Learning by Asking

ROBERT U. MASSEY, M.D.

Last month David Goodstein, professor of physics at the California Institute of Technology, wrote an article for the *Los Angeles Times* lamenting the low estate to which science teaching in this country had fallen. He recalled a conversation between the Nobel Prize winner, Richard Feynman, and the Princess of Sweden in which the irrepressible Feynman assured her that they most certainly could talk about physics because everyone "does know something about physics," but not about philosophy or psychology "because nobody knows anything about those subjects." They were too hard, he said, while physics, on the other hand, was easy.

My father taught high school physics in Detroit in the 1920s and 30's. Since my elementary school was next door to Central High School, he and I went together each morning an hour or so before my classes began, and I helped him set up the laboratory for the day's teaching. Before putting out the equipment he always noted the time, the temperature, and the barometric pressure on the black board, and often started the one-second deadbeat pendulum swinging. A needle attached to the bottom of the bob touched a small mercury bath on each swing causing a telegraph key to sound out the seconds. Timing was essential especially for those experiments in free fall that used little counterbalanced cars running down incline planes, almost the same apparatus that Galileo used, only instead of a pendulum for timing he had used a kind of water clock.

After school I returned for an hour or so to wait in the magical equipment room for my father to finish the day's work. There were static machines that would make sparks jump between little steel balls, Leyden jars, batteries that could be made to turn small armatures betweeen the ends of horseshoe electromagnets, big, fragile Crookes tubes, and little bottles with Pascal's divers, red devils that would rise from the bottom when you squeezed the apparently unsqueezable glass. There were old, rebuilt Model-T generators that you could crank; my father and I would see who could hold the wires longest while the other cranked faster and faster. I remember one day when he and his students weighed the earth, and he talked about the expanding universe, comparing it to the surface of a balloon being blown up. Another time he set up an electrolysis apparatus, filled a balloon with the hydrogen bubbling from the cathode, and released it out the window.

At least one of his students later became a world class physicist; I know nothing about the rest. Luckily, Mr. Clarke, my own high school physics teacher, was as filled with the wonder and fun of science as my father; I still recall his description of the right-hand rule for magnetism and electrical currents, and I have explained to my granddaughter how a prism splits light into colors beginning with red and ending with violet using almost his very words. For her high school science was dull; until she and I spent an afternoon talking about it she had seen nothing remarkable in Mendeleev's periodic table. I believe it was because she was being given answers to questions she had never asked. Before we had learned about atomic structure, our class had spent a lot of time wondering about the constant proportion of elements in compounds, and trying to explain valence. I remember being led step by step to understand Bohr's model; for her 50 years later atomic structure was a given, no mystery, just something to memorize for an examination.

Professor Goodstein wrote that there were two essential elements to teaching science: "One is to know your subject. The other, more subtle and more difficult, is that you have to be able to remember what it was like not to understand something you now understand."

Some medical schools are now teaching medicine by presenting first-year students with real clinical problems and helping them to work back through pathology, pathophysiology, and cellular and molecular biology to understand what they had observed in the clinical event. That, after all, was the way we came to the science of medicine in the first place, by following the method of Hippocrates, Bacon, Morgagni, Louis, and a host of other careful observers, looking closely at nature and then trying to discover "how come?" The reductionist explanations, the science, came later.

Not all of these experiments in medical education have worked; the tall order, as Goodstein said, is to find teachers who remember what it was like not to know. Teachers like that need to follow no prescribed methods; they have discovered that teaching lies not in parading their own knowledge, but rather in leading students to see the wonder of the world and to imagine what questions to ask.

ROBERT U. MASSEY, M.D., Professor, Division of Humanistic Studies in Medicine, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington.

50 Years Ago
From the *Journal of the Connecticut State Medical Society*
January 1940

Further Studies in the Therapy of Acute Anterior Poliomyelitis

C. L. THENEBE, M.D., AND M.S. HIRSHBERG, M.D.,
Hartford

The horror of the maiming associated with infantile paraylsis tautens the heart strings of the public greater than any other disease known to man.

We fully realize that any workable measure in prophylaxis would be the ideal objective. Since such a procedure is at present not available, then any therapeutic plan which could prevent the progress or the appearance of paralysis after the disease has developed would occupy the second role in importance. According to recognized authorities, the usual expectancy of paralysis in patients presenting symptoms of acute anterior poliomyelitis is approximately 40 to 60%.

A previous preliminary report on 33 cases of preparalytic poliomyelitis treated with intramuscular injections of sterile milk[1] revealed 6% of the cases showing appreciable paralysis or weakness under this form of therapy. The unusually low incidence of this sequel of the disease in this series seemed to present a step up toward the right goal, since the percentage was lower in those cases treated with human convalescent serum (20.4%).[2]

Since reporting the above series, we have accumulated twenty-seven additional cases from 1932 on, treated with the intramuscular injections of sterile milk to effect the non-specific protein reaction. This acclerates the body defense mechanism with a febrile reaction which also aids in combating the infection. In addition to the milk, dehydration measures were added to reduce the overwhelming edema in the cord or cranial nuclei which might tend to destroy these ganglion cells. At first 50% glucose was used, to be entirely supplanted later by 50% sucrose solution.[3] Limitation of fluid intake was used in conjunction with this.

At present our routine is as follows: aside from the initial diagnostic lumbar puncture and absolute bed rest, 1 to 4c.c. (according to the age of the patient) of sterile milk is injected intramuscularly at 12 to 24 hour intervals for 3 or 4 injections; fifty (50 to one hundred (100) c.c. of 50% sucrose solution (less in infants and young children) are injected intravenously at 12 hour intervals for 5 or 6 injections; the fluid intake over a period of 72 hours in limited according to the age, the top limit being 950 c.c per day for adults. Dehydration is carried out for longer or shorter periods according to the patients condition.

Since 1932, 74 cases of poliomyelitis have been admitted to the Isolation Division of the Hartford Municipal Hospital. For clarity these cases were divided as follows:

Group I-27 cases (36.4%) admitted in the preparalytic stage.

Group II-47 cases (63.6%)·admitted the weakness or paraylsis.

Group III-35 cases (47.3%) of group 2. These were the spinal type of poliomyelitis.

Group IV-12 cases (16.3%) of group 2. These were the bulbar type. One case (1.3%) of this group was a combined bulbar and spinal type, while another presented bulbar and encephalitic involvement.

During this period, 5 cases of Landry's ascending paralysis were admitted. There is no definite reason to suspect that these cases had the poliomyelitis virus as the exciting etiological factor.

The statistics of each group follows: The preparalytic group comprised 17 males and 10 females. The age group represented 1 case at 4 months, 2 at 4 years, 1 at 5 years, 4 at 7 years, 4 at 8 years, 2 at 9 years, 3 at 10 years, 3 at 11 years, 1 at 12 years, 2 at 13 years, 1 at 14, 15, 19 and 27 years, respectively. No subsequent paralysis developed following admission in any patient of this group. One (3.7%) of the 8 year old group of patients who was admitted to the hospital after 4 days of illness developed a bilateral weakness of the quadriceps extensors, which weakness subsequently disappeared entirely before hospital discharge. The low incidence of weakness and the absence of paralysis in this group was beyond expectations.

Of the group 3 cases, twenty four (31.9%) were admitted paralyzed. Fifteen were unimproved and eight improved upon discharge. One case recovered completely. Those receiving the therapy in this group showed a greater improvement than those who did not.

The remaining eleven cases (15.3%) of group 3 were admitted with muscular weakness but without paralysis. This entire group received the therapy. Eight (73%) recovered completely and the remaining three (27%) were definitely improved upon discharge.

Of group 4 comprising 12 cases, 3 (25%) recovered completely, 1 (83%) was unimproved, 6 cases (50%) were improved and 2 cases (1 bulbar and 1 bulbar-encephalitic) died, the morality being 16.7%. (All of this group received the therapy excepting the bulbar-encephalitic case.) We believe that the mortality in this group is also very low. All expired in the Landry's ascending group of cases. Four of these cases received one injection of 1 to 3 c.c. of sterile milk.

Taking the group as a whole, i.e., the 74 cases, there was a mortality of 2.7%, complete recovery in 52.7%, improvement in 22.9% and no improvement in 21.6%.

We have extended the use of the therapy upon cases of primary and secondary encephalitis, particularly those following or accompanying epidemic parotitis, rubeola and influenza, and have been gratified for the most part with the end results, especially when the therapy was administered early. Further study, however, is truly in order for enlightenment.

In some of the patients who had developed muscular weakness or apparent paralysis within twelve hours after the onset of the symptoms of infantile paralysis, almost complete recovery of the involved muscle groups has been observed within twenty four hours.

Again, the older patients will often comment that their headaches have subsided either during or after the completion of the first intravenous treatment.

Of course several considerations must be borne in mind. We know that the preparalytic cases reported are few in number. The cases have not been controlled and the infection could have been mild. However, 63.6% of the cases admitted during the same period showed paralysis or weakness. Perhaps 40% of the preparalytic cases reported would not have developed paralysis, even without the treatment. Finally, the possible ordeal of the therapy should be heeded. *However, we believe that the absence of paralysis in the group, under our form of therapy, will more than equalize the final objection.*

The salient reason for reporting these cases is to make the therapy known so that other investigators may ascertain its worth. Otherwise, because of the dearth of cases, an epidemic excepted, the study would extend beyond a life time before sufficient cases would be accumulated to be of true value.

Summary

1. Twenty seven consecutive cases of preparalytic infantile paralysis (36.4% of the total admissions) treated with non-specific protein (intramuscular sterile milk), intravenous 50% sucrose and dehydration (restricted intake) are herein reported. There was no paralysis nor mortality in this group. One case developed weakness, which subsequently disappeared entirely before hospital discharge.

During a simultaneous period, 47 cases (63.6%) were admitted with either weakness or paralysis.

2. The early administration of this therapy is advocated.

3. The therapy was used in cases presenting muscular weakness and paralysis upon hospital admission with apparent arrest of the process sooner than is usually expected. A rapid recovery was striking in many instances. This was particularly true in the group admitted with weakness only. 73% of these recovered completely and the remaining 27% were improved. In the paralytic group ganglion cell destruction had often completed before hospital admission. In these cases the results would be disappointing with any therapy.

4. Of the 47 cases admitted in the stage of weakness or paralysis, including the bulbar cases, twelve (25.5%) recovered completely, 17 (36.1%) definitely improved, 16 (34%) were unimproved and 2 (4.2%) died. In the entire group (74 cases) there was a mortality of 2.7%, complete recovery in 52.7%, improvement 22.9% and no improvement in 21.6%.

5. Aside from poliomyelitis, we have used the therapy in primary and secondary encephalitis with gratifying results in most cases, which, however, were few in number.

6. Further study on a larger scale would be advantageous in evaluating this therapy, both in poliomyelitis and encephalitis.

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We are indebted to Drs. Aaron Bobrow and Eugene Lamoureux for accumulating the statistical material and aiding in construction of this paper.

Letters to the Editor

Letters to the Editor are considered for publication (subject to editing and abridgment), provided that they are submitted in duplicate, signed by all authors, typewritten in double spacing, and do not exceed 1½ pages of text (excluding references). They should not duplicate similar material being submitted or published elsewhere. Letters referring to a recent *Journal* article should be received within six weeks of the article's publication.

MORE ON PODIATRIC SURGERY

To the Editor: We, as leaders of the Connecticut Podiatric Medical Association read with great interest, the article in the September 1989 issue of *Connecticut Medicine* entitled "Surgery by Non-Surgeons: Podiatric Surgery in Connecticut" written by John C. Russell, M.D. As the Chairman of the Hospital Committee of the Connecticut Podiatric Medical Association and as President of the C.P.M.A., we feel it is appropriate to respond to this article.

Overall, we feel that this article represents a balanced view of the state of podiatric medicine in the hospitals in Connecticut. The five recommendations made in this article are all positive recommendations and do not necessarily conflict with the C.P.M.A.'s view on the role of podiatrists in hospitals. Certainly, no one would argue that any surgeon should have the procedure specific privilege delineation based on their training, competency, and experience. In fact, this is exactly what the podiatric surgeons have been attempting to achieve in the hospitals throughout Connecticut. The question of which surgeons should do a carpal tunnel procedure should be answered not by turf wars over the wrist but rather by the training, experience, and competency of those surgeons who profess to have the training to do such a procedure. In the same light, the turf war over who should do foot surgery should be answered not by who shall do it, but rather who is best trained to perform those specific procedures and it may be that orthopedic surgeons, podiatrists, and general surgeons may all individually have specific training in foot surgery and may be equally qualified to perform such procedures.

There is one specific area to which we would take exception. Dr Russell wrote that because practitioners in traditional surgical disciplines have broader medical background by virtue of their training and five years of postgraduate residency training, it is felt that these surgeons must, "by definition," deliver a better standard of care than a podiatric surgeon when they perform the same surgical procedure. We believe that this "feeling" has never been substantiated and in fact, during an orthopedic surgeon's five years of residency training, the training that is specifically done on foot surgery may be minimal, especially in the light of the Johns Hopkins study which demonstrated that over 70% of the foot surgery done in this country is done by podiatric surgeons rather than orthopedic surgeons.

Patients admitted to hospitals in Connecticut by podiatrists have physicians attending to the medical aspects of the hospitalization. This is not necessarily the case with orthopedic surgeons. Using the logic in Dr. Russell's article, internists, cardiologists, and endocrinologists, by virtue of their training in medicine, must "by definition" deliver a better standard of medical care than an orthopedic surgeon could during an admission for a particular surgical procedure. Therefore, a podiatrist, along with a co-admitting internist or cardiologist together would produce a service which must, "by definition," be at a better standard of care than an orthopedic surgeon could perform alone. The reality of the situation is that orthopedic surgeons do not practice in a vacuum and neither do podiatric surgeons. They *both* operate in the hospital with the various medical specialties being called upon for their expertise so that a podatric surgeon whose expertise is in foot surgery, very often will call in an infectious disease expert, a diabetologist, or a vascular surgeon to consult on a particular case as would a responsible orthopedic surgeon. To say that a podiatric surgeon does not have a broad medical background does not mean that medical care is somehow denied patients who are admitted to the hospital by podiatrists. Quite the contrary, the podiatrist will call in subspecialists to care for the areas of patient problems that are outside his scope of practice.

In summary, we would congratulate Dr. Russell on a well-researched paper on the subject on which there are varied opinions but very little in the way of facts. By summarizing the facts, Dr. Russell has come up with recommendations which, if fairly implemented, would mean that qualified podiatrists would have greater access to hospitals in Connecticut and, as a result, the quality of patient care to podiatric patients could only be enhanced.

Dr. Russell's observation that podiatric surgeons have not contested physician involvement in the credentialling process in the courts of Connecticut is quite correct. He is also quite correct in that the involvement of physicians and podiatrists in the credentialling, supervision, and quality assurance programs is a positive step and podiatrists, in no way, feel threatened by physician involvement. Podiatrists who are involved in peer review and quality assurance are also interested in assuring that procedures that are performed are performed with proper indications.

By and large, we feel that this article was a balanced, rational approach to the subject of foot surgery by podiatric surgeons in Connecticut. We do take exception to being referred to as "non-surgeons" in the title of the article, as medical dictionary definitions of "surgeon" are *not* limited only to those with an M.D. degree. However, if the recommendations outlined by Dr. Russell were adopted in all 38 hospitals in the State of Connecticut, the level of quality assurance and patient care could only benefit.

Martin M. Pressman, D.P.M., F.A.C.F.S.
Chairman, Hospital Committee, C.P.M.A.
Robert E. Sherman, D.P.M.
President, C.P.M.A.

Hartford

The above letter was referred to the author of the article in question, who offers the following reply:

To the Editor: Drs. Pressman and Sherman have raised several interesting points in regard to my recent article, "Surgery by Non-Surgeons, Podiatric Surgery in Connecticut". They question my comment that " orthopedic surgeons, because of their broader medical training and five years of postgraduate residency training, must 'by definition' deliver a better standard of care than a podiatric surgeon when they perform the same surgical procedure." While, clearly, the podiatrists do not share this view, I think it is a fair reflection of the general feeling on the matter as expressed by the medical community and should be recognized as such by the podiatric surgeons as they work toward greater inclusion on medical staffs. Their other comment concerns the articles title, labeling podiatric surgeons as "non-surgeons." This comment is as valid as that of any other operating physicians, such as oral and maxillofacial surgeons who have dental degrees but do not carry an M.D. There is certainly no legal requirement for an M.D. degree to be called a "surgeon" in Connecticut.

The title, as well as the article, was meant to provoke debate, and I am pleased by the response initiated. An open and ongoing dialogue between the medical community and podiatry community can only result in better patient care for all patients with foot disease in Connecticut.

New Britain John C. Russell, M.D.

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Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalmic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it; however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

Indications: Yocon® is indicated as a sympathicolytic and mydriatric. It may have activity as an aphrodisiac.

Contraindications: Renal diseases, and patient's sensitive to the drug. In view of the limited and inadequate information at hand, no precise tabulation can be offered of additional contraindications.

Warning: Generally, this drug is not proposed for use in females and certainly must not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

Adverse Reactions: Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug.[1,2] Also dizziness, headache, skin flushing reported when used orally.[1,3]

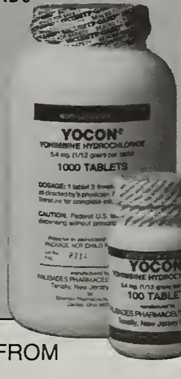
Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.[1,3,4] 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to ½ tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.[3]

How Supplied: Oral tablets of Yocon® 1/12 gr. 5.4 mg in bottles of 100's NDC 53159-001-01 and 1000's NDC 53159-001-10.

References:

1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

Rev. 1/85



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IN MEMORIAM

BARALD, FRED C., Boston University, 1936. Dr. Barald was a radiologist in the Hartford County area since 1937. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 21 October 1989 at the age of 80.

BENOIT, RAOUL, Georgetown, 1926. Dr. Benoit was an obstetrician and gynecologist in the Hartford County area since 1927. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 10 September 1989 at the age of 91.

KENIGSBERG, NATHANIEL, Yale, 1939. Dr. Kenigsberg was a surgeon in the Fairfield County area since 1940. He was a member of the Fairfield County Medical Association and the Connecticut State Medical Society; died 22 November 1989 at the age of 76.

RADOM, MYRON, M., Jefferson, 1925. Dr. Radom was an internist in the Hartford County area since 1926. He was a member of the Hartford County Medical Association and the Connecticut State Medical Society; died 17 November 1989 at the age of 93.

SAYERS, DANIEL O., Tufts, 1935. Dr. Sayers was a psychiatrist in the New Haven County area since 1935. He was a member of the New Haven County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 18 October 1989 at the age of 80.

SULLIVAN, ARTHUR F., Jefferson, 1942. Dr. Sullivan was a general practitioner in the New Haven County area since 1945. He was a member of the New Haven County Medical Association and the Connecticut State Medical Society; died 7 October 1989 at the age of 72.

YOUNG, DANIEL D., Tufts, 1932. Dr. Young was a family practitioner in the New London County area since 1965. He was a member of the New London County Medical Association and the Connecticut State Medical Society; died 27 September 1989 at the age of 81.

AROUND THE STATE

Medical Expo 1990

On 25 and 26 April HCMA will sponsor their annual Medical Expo at the Hartford Civic Center. This will be the fifth anniversary celebration of these programs on critical health care issues for medical and health professionals.

New ConnMAP Income Levels

The income levels for the Connecticut Pharmaceutical Assistance Contract (ConnPACE) have increased to $13,800.00 for a single individual and $16,600.00 for a married couple.

Since the law regulating the Connecticut Mandatory Assignment Program (ConnMAP) requires its income levels to be 150% of ConnPACE, the new income levels for ConnMAP are $20,700.00 for a single individual, up from $19,950.00, and for a married couple the level is now $24,900.00, up from $24,000.00.

Stephen Brown, M.D., donated a memorial to Vietnam veterans which will be permanently exhibited in the Legislative Office Building in Hartford. The statue is a scaled-down version of the one in Washington, DC. Dr. Brown is a Vietnam veteran who spent a year treating birth defects among Vietnamese children.

Muceddit T. Ergin, M.D., of West Hartford was recently appointed as vice-president of the Connecticut Division of the American Cancer Society. **Andrew Salner, M.D.,** is the new chairman of the ACS Medical Affairs Committee.

William R. Hunt, M.D., has been appointed director of the emergency department at Greenwich Hospital.

Arnold M. Katz, M.D., professor of medicine and head of the cardiology division at the University of Connecticut School of Medicine, is a corecipient of the most prestigious research award given annually by the American Heart Assocation. He received the 1989 Research Achievement Award for his work on calcium as the trigger mechanism controlling the heart beat.

The Connecticut Peer Review Organization, Inc., reelected **Ramon N. Kranwinkel, M.D.,** a Danbury pathologist, to a three year term on the CPRO Board of Directors.

Wayne S. Levin, M.D., Bridgeport, has been named chairman of the department of medicine at The Park City Hospital. **Joel S. Feigenson, M.D.,** a Bridgeport neurologist, was elected president of the medical staff at the same hospital.

Roger E. Meyer, M.D., professor and head of the department of psychiatry at the University of Connecticut School of Medicine was appointed executive dean of the School of Medicine. He will retain his postion as head of psychiatry.

CSMS PHYSICIAN PLACEMENT SERVICE

The Society maintains the Physician Placement Service as a service to the medical profession in Connecticut. Opportunities for physicians to locate in Connecticut will be published as space permits and will be distributed to physicians making inquiries of such opportunities. Information should be sent to 160 St. Ronan St., New Haven, CT 06511 (203-865-0587).

Physicians wishing to establish practice in Connecticut are invited to submit a resume to be kept on file with the Society. An announcement of a physician's availability will be published in two issues of *Connecticut Medicine* as space permits.

Listing of physicians in the Placement Service does not in any way represent certification by the Society. Investigation of credentials and experience is the responsibility of those seeking applicants for positions.

OPPORTUNITIES FOR PRACTICE

AMBULATORY CARE

Part-time. Seeking physician to cover weekends at the Medical Walk-In Center of Westport. Must have malpractice coverage. Hours: Sat. 9-6; Sun. 10-6. Contact A.T. La Marca, M.D., at 272 Post Rd. E, Westport, CT 06880. (203) 454-1012.

Full time or part time position available for physician (preferable background in Family Practice or Internal Medicine) in established Walk-In Center in Branford, CT. Pleasant working conditions; competitive salary; shoreline location. Please send CV to: Harry Ardolino, M.D., Coastline Medical Center, 9 Business Park Dr., Branford, CT 06405 or phone (203) 481-0818.

Full time position available for an ambulatory care physician to work in an established walk-in center in the greater Bridgeport area. Broad general medical experience requiring minor surgery, orthopedics and excellent diagnostic skills; family practice, emergency medicine, internal medicine preferred. Connecticut license required at the time of application. Salary and benefit package commensurate with experience. Please send CV to Immediate Health Care, 15 Armstrong Rd., Shelton, CT 06484, Attn: Darlene Breving.

EMERGENCY MEDICINE

Urgent visit physicians. CHCP, a pre-paid Staff Model HMO in its eighteenth year of service with over 68,000 members is seeking Urgent Visit/E.R. physicians for positions currently available and for positions which will start within the next year. Affiliations with prestigious institutions such as Yale New Haven Hospital enable our staff to provide high quality medical care while offering opportunities to maintain clinical skills in the setting of an established HMO. Highly competitive compensation package. Send CV along with salary requirements in confidence to: Charles Hollander, M.D., Medical Director, Community Health Care Plan, Inc., 150 Sargent Dr., New Haven, CT 06511. (203) 781-4100, Fax (203) 562-2802. We are an equal opportunity employer.

FAMILY PRACTICE

Four doctor family practice group seeks board certified/board eligible family practitioner to join them in May 1990 (or soon after). Busy office and hospital including ICU, CCU, Pediatric, and Nursery privileges. (No. O.B.). Shoreline community with excellent schools and quality of life. Favorable call schedule. Both full and part-time considered. Send CV to Dr. Steven W. Luger, 8 David Rd., Old Lyme, CT 06371 or call (203) 434-8300.

Central Connecticut location. Opportunities for practice exist both in group setting and for a solo practitioner. One Hundred and sixty-bed hospital, readily available consultative services, CT, MRI, and Linear Accelerator. ICU, CCU privileges commensurate with experience/training. Attractive countryside with excellent recreational, cultural opportunities. Write to CSMS, c/o FP/RB.

Searching for a new associate in a group practice located in the beautiful town of Suffield, CT. Excellent compensation and partnership terms. Please direct your reply to Suffield Medical Associates, 162 Mountain Rd., Suffield, CT 06078 or telephone (203) 668-1211/668-4177.

INTERNAL MEDICINE

Internist, lower Fairfield county. Prefer previous clinical experience. Very pleasant one physician office available halftime; adjacent space for expansion when desired. Sublet with salary guarantee. Send CV to: Mrs. Jeff Bell, 210 Sound Beach Ave., Old Greenwich, CT 06870.

The Newington Medical Care Center has full and part-time medical positions immediately available. Competitive salaries, pleasant working conditions; 955 Main St., Newington, CT 06111. (203) 665-0350.

For sale or lease or share: fully equipped medical office; central location; 20 miles north of New Haven. Ideal for satellite office for one or two doctors. Low rent. Physician retiring. Write, CSMS, c/o IM/NV.

MISCELLANEOUS

Free-basis, part-time, physicians needed to assist in physical examinations at the New Haven Military Entrance Processing Station. Ideal for retired family practitioners, internists and pediatricians. MD's or DO's must be licensed in a state or territory of the United States, DC or PR. No malpractice insurance needed. $125.00 to $150.00 for short morning. Call Dr. Gerhard Mack (203) 787-3823 or write: Commander, New Haven MEPS, 150 Court St., 4th floor, New Haven, CT 06510-2056.

OBSTETRICS AND GYNECOLOGY

Opportunity for BE/BC, OB/GYN to join modern, progressive solo practice associated with 800-bed tertiary care teaching hospital with Level III Neonatal unit. Excellent university affiliated residency program. Emphasis on quality care with efficient staff including nurse practitioner. Academic appointment available. Laser, cryo, colpo and hysteroscopy. Family oriented community. Competitive salary. Please send CV to George Bacall, M.D., 21 Woodland St., Hartford, CT 06105. (203) 278-4141.

OPHTHALMOLOGY

For Sale. Eye Surgeon Practice; well-known. University town. Connecticut license and own malpractice needed. Write, P.O. Box 1085, Orange, CT 06477.

OTOLARYNGOLOGY

Otolaryngology. Three physician group, desires fourth BE/BC associate, with or without subspecialty interests. Centrally located; competitive package; satisfying practice opportunity. Send CV to CSMS, OTO/MD.

PEDIATRICS

Full or part time associate to join four person pediatric group in a New Haven suburb located five miles from Yale-New Haven Medical Center. Earnings will be 55% of gross income. Call 248-4846 any evening after 7:00 P.M.

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ANESTHESIOLOGY

Immediately. Age 46. Licensed in Connecticut. Presently in practice, MD, University of Tehran, Tehran, Iran; Int., University of Tehran; Res., The Johns Hopkins Hospital. Baltimore, MD; Fellowship, University of Maryland, Baltimore, MD. Prefers solo or associate type practice. Write, Natalie Madison, M.D., 1616 Imperial Ridge, Las Cruces, NM 88001.

GENERAL SURGERY

July '90. Age 33. Presently in practice. Nat'l bds. AB elig. MD, Howard University, Washington, DC; Int., DC General Hospital, Washington, DC; Res., University of Medicine & Dentistry, Newark, NJ. Prefers group or associate type practice in a medium to large-sized community. Write, CSMS, c/o VL/GS.

INTERNAL MEDICINE

July '90. Age 35. Licensed in Connecticut. Nat'l bds. AB cert. DO, New York College of Osteopathic Medicine, Old Westbury, NY; Int., Baptist Medical Center of NY, Brooklyn, NY; Res., Norwalk Hospital, Norwalk (IM); Fellowship, Long Island Jewish Medical Center, New Hyde Park, NY (Rheumatology). Prefers solo, group or associate type practice. Write, Jeffrey Helfand, D.O., 255-13 73rd Ave., Glen Oaks, NY 10004.

Sept. '90. Age 33. Nat'l bds. AB cert, MD, Loma Linda University, Loma Linda, CA; Int., University of Nevada, Reno, NV; Res., Presyterian University of Pennsylvania Medical Center, Philadelphia, PA: Chief Medical Resident, Episcopal Hospital, Temple University, Philadelphia, PA; Interested in group practice or in a teaching affiliation . Write, Cynthia L. Christoph, M.D., 334 NE 103rd St., Miami Shores, FL 33138.

NEUROLOGY

Jul '90. Age 31. Licensed in Connecticut. Nat'l bds. AB elig. MD, University of East, Quezon City, Philippines. Int., University of Medicine and Dentistry of New Jersey, Newark, NJ (IM); Res., Nassau County Medical Center, East Meadow, NY (NEUR); Fellowship, Nassau County Medical Center, East Meadow, NY (Electrophysiology). Prefers group or institutional type practice. Write, Victor E. Ylagan, M.D., 299 Carman Ave., Apt. 12-C, East Meadow, NY 11554.

PEDIATRICS

Sept. '90. Age 40. FLEX. AB elig. D.O., University of Osteopathic Medicine and Health Science, Des Moines, IA; Res., Pennsylvania State University/Hershey Medical Center, Hershey, PA. Prefers group or associate type practice in a small size community. Write, Christine B. Wilson, D.O., 123 Townhouse - Briarcrest Gardens, Hershey, PA 17033.

RADIOLOGY

July '90. Age 32. Nat'l bds. AB cert. MD, Loma Linda University, Loma Linda, CA; Int., University of Nevada, Reno, NV; Res., Chief Resident, Germantown Hospital and Medical Center, Philadelphia, PA; Fellowship, University of Miami, Miami, FL. Prefers group or institutional type practice. Write, James L. Greve, M.D., 334 NE 103rd St., Miami Shores, FL 33138.

May '90. Age 44. Nat'l bds. AB cert. MD, New York Medical College, New York, NY; Int., Lenox Hill Hospital, New York, NY; Res., NY Medical College, New York, NY; Fellowship, Metropolitan Hospital Center, New York, NY. Prefers group or institutional type practice. Write, William Cristo, Jr., M.D., 12 Delafield Dr., Lenox, MA 01240.

PAID CLASSIFIED ADVERTISING

All paid classified advertising orders, correspondence and payments should be directed to: CONNECTICUT MEDICINE, Classified Department, 160 St. Ronan St., New Haven, CT 06511. The classified rates are as follows: $60.00 for 25 words or less; plus $1.00 for each additional word. For confidential answers, the cost is $3.00 per insertion, sent in care of CONNECTICUT MEDICINE. Ad copy, with payment, must be received no later than the first day of the month preceding month of issue.

RADIOLOGY. EXCLUSIVE RADIOLOGY Service Contract: Charlotte Hungerford Hospital invites inquiries by interested radiology groups in providing a full scope of services including radiology services, CT, ultrasound, interventional radiology, nuclear medicine and MRI through an exclusive contract with the hospital. Interested physician groups wishing a copy of the hospital's Request for Proposal can contact Mr. Dennis K. Moriarty, President/Chief Executive Officer, Northwest Connecticut Healthcare System, Inc., 336 Pinewoods Rd., Torrington, CT 06790 (203) 496-0766. Charlotte Hungerford Hospital is a 188-bed private not-for-profit hospital and sole community provider in beautiful rural Northwest Connecticut.

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BOARD CERTIFIED OPHTHALMOLOGIST, 35, well-trained, easygoing, seeks practice position with partnership potential. Reply, A.E. Gewirtz, M.D., P.O. Box 399, Jericho, NY 11753.

Childhood Injuries in Hartford, Connecticut

GARRY LAPIDUS, PA-C, M.P.H., AND LEONARD BANCO, M.D.

ABSTRACT—Vital statistics and hospital discharge data were analyzed to provide a detailed epidemiologic profile of injury among Hartford residents 0 to 19 years of age. During 1980-86, 76 death certificates identified injury as the cause of death, resulting in an annual age-specific death rate of 2.3 per 10,000 persons. Injuries caused more deaths among one to 19 year olds (58%) than all other diseases combined. During 1982-86 injury was listed as the principal diagnosis leading to hospitalization for 2,220 Hartford residents 0 to 19 years. The hospitalization rate was 95 per 10,000 persons. Injuries accounted for 16% of all hospital discharges. For ages 0 to 19, homicide was the leading injury-related cause of death accounting for 43% of fatalities. Falls were the leading cause of injury-related hospitalizations accounting for 22% if all discharges. Clay-Arsenal (23%) and the Northeast (17%) neighborhoods accounted for the largest proportion of injury deaths. Actual inpatient hospital charges for 1986 were reviewed. The total cost for 420 injury discharges utilizing 2,208 hospital days exceeded $1.4 million dollars. Fifty-one percent of the injury discharges listed Medicaid as the primary expected payment source for acute care injury-related discharges. The statistical patterns identified in this report will help public health professionals establish goals for injury control efforts such as a reduction in morbidity, mortality, severity, and/or medical costs.

Introduction

INJURIES are a major cause of premature death and disability for persons 0 to 19 years of age.[1-3] To date, no detailed compilation of injury statistics for urban Connecticut residents in this age group has been published. We conducted a descriptive epidemiological study of childhood injuries utilizing seven years (1980-86) of vital statistics data and five years of hospital discharge data (1982-86).

The objectives of this report are: 1) to document the importance of injuries in relation to other health problems in Hartford, 2) to describe the distribution and rates of injuries by age, sex, and cause, 3) to describe injury by temporal patterns and by place of victims' residence, and 4) to calculate cost of inpatient hospitalization attributable to injury. In so doing, we are able to identify childhood injury problems for further study by analytic methods and provide a data base to plan, implement, and evaluate a comprehensive injury prevention program.

Materials and Methods

Data on fatal diseases and injuries were obtained from the Connecticut Department of Health Services and include all deaths among Hartford residents 0 to 19 years of age for the seven year period 1980-86. Causes of death are categorized in accordance with the International Classification of Disease, Ninth Revision, 1980 (ICD-9-CM).[4]

In addition, injury deaths of Hartford residents 0 to 19 years of age were extracted from mortality computer files for the same time period, 1980-86. Injuries are defined as those cases with an external cause of death code between E800-E999 in the ICD-9-CM classification system. The following variables were available on each injury death for analysis: age, sex, cause, place of residence (street address), and date of death.

The Connecticut Health Information Management and Exchange (CHIME) is the statewide data bank of the Uniform Hospital Discharge Data Set (UHDDS) from 36 acute care hospitals in Connecticut. The CHIME data base is a data resource program of the Connecticut Hospital Association. CHIME generated special study reports summarizing all hospital discharges meeting the following criteria: 1) patients' age at time of discharge was 19 years or less, 2) patients' place of residence at time of discharge was Hartford, and 3) the patients' date of discharge fell within 1982-86.

There were 16 of 36 acute care hospitals in Connecticut in which Hartford residents were hospitalized and for which CHIME data on injuries and diseases were obtained. The principal discharge diagnoses aggregated according to the ICD-9-CM codes were used to categorize cases for this report. Injury cases were defined as discharges with a principal diagnosis in the ICD-9-CM

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Reprint requests to: Department of Pediatrics, Hartford Hospital, Hartford, CT 06115-0729 (Mr. Lapidus).

system as Injuries and Poisonings (codes 800-999). Excluded from the analyses were discharges with a disposition of death and transfers from another acute care hospital. Deaths were excluded to avoid double counting the cases identified by vital statistics. Transfers were excluded to avoid double counting of a second discharge for the same case. The following variables for each injury hospitalization were available for analysis: age, sex, place of residence (zip code), year of discharge, nature and cause of injury, and primary expected payment source. In addition, actual hospital charges for 1986 were obtained. The 1980 Census Data for Hartford residents was used as the denominator to compute annualized age and sex specific rates per 10,000 persons.[5]

Results

A. Injuries in relation to other problems

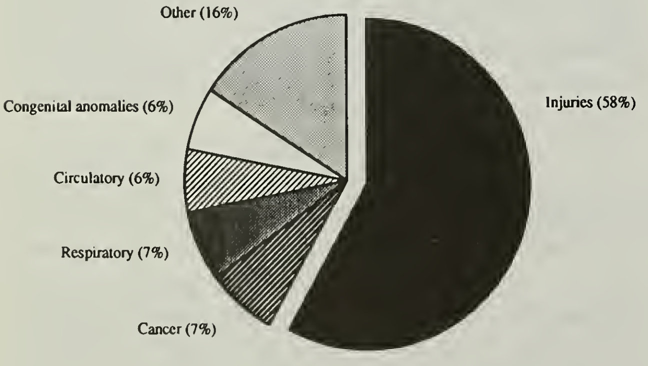
Mortality

Between 1980-86, there were 444 deaths among Hartford residents under 19 years of age. This results in approximately 63 deaths per year and an annual age specific death rate of 13.6 per 10,000 persons.

Overall injury accounts for 17% of all deaths. Among infants less than one, perinatal conditions (60%), congenital anomalies (15%), and sudden infant death syndrome (11%) all outrank injuries, which account for just 3% of all deaths. However, among persons one to 19 years of age, injury is the leading cause of death, accounting for 58% of all fatalities, with deaths due to cancer (7%), respiratory diseases (7%), and circulatory diseases (6%) the next most common causes (Figure 1).

PERCENT OF DEATHS BY CAUSE,

1 - 19 YEARS, HARTFORD 1980-86



N = 115

Source: Connecticut Vital Statistics

Figure 1

The proportion of deaths attributable to injury increased with increasing age. Among infants less than one, 3% of all deaths were injury related; among children one to four years, 45%; five to nine years, 56%; 10 to 14 years, 58%; and among adolescents 15 to 19 years, 68%.

Morbidity

The number and rate per 10,000 persons of inpatient hospital discharges for Hartford residents treated in Connecticut hospitals (1982-1986) by diagnostic category, age, and sex were analyzed.

Injury accounted for 16% or 2,220 discharges of the 14,211 total hospital discharges, averaging 444 discharges, and 2,244 total hospital days per year. The annual age specific injury hospitalization rate is 95 per 10,000 persons (+/-17.8 at 95% CI) and the average lenth of stay (ALOS) for injury is five days.

When compared to other disease groups as a cause of hospitalization, injury (16%) ranks only behind respiratory diseases (24%), in frequency (Figure 2).

Unlike the mortality data, the proportion of hospitalizations attributable to injury did not vary appreciably by age. Among children under four years, injuries accounted for 11% of all discharges, among five to nine years, 18%; among 10 to 14 years, 16%; and among adolescents 15 to 19 years, 17%.

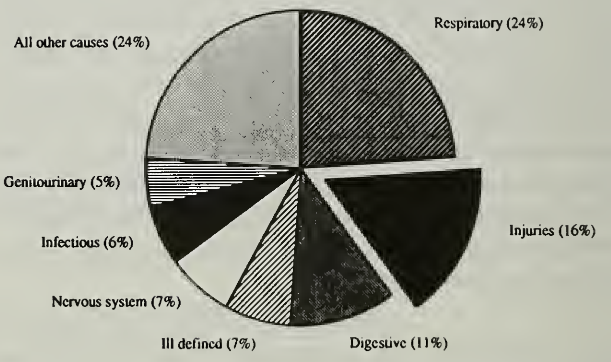
B. The incidence and causes of childhood injuries in Hartford

The risk of injury by age

Injury deaths vary in a nonlinear fashion by age; among infants less than one, a rate of 5.5 per 10,000 persons was observed; for one to four year olds, the rate was 2.3; for five to nine year olds the rate was 2.1; for 10 to 14 year olds the rate was 0.9; and for adolescents 15 to 19 years, 3.1 deaths per 10,000 was noted (Figure 3).

PERCENT OF HOSPITALIZATIONS BY CAUSE,

0 - 19 YEARS, HARTFORD 1982-86



N = 14318

Source: Connecticut Hospital Association

Figure 2

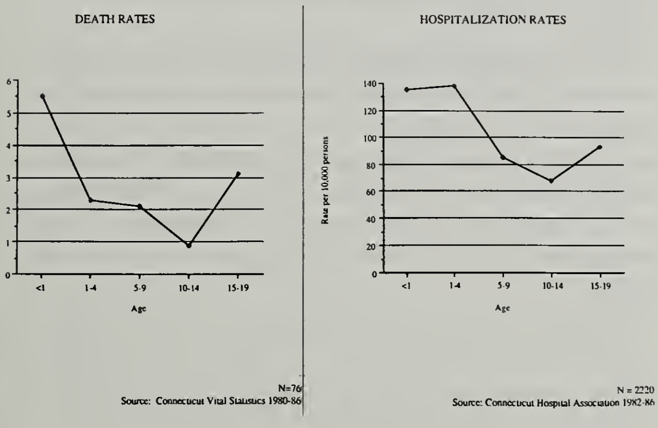
Hospitalization rates vary by age: Among infants less than one, a rate of 135 per 10,000 persons was observed. Children one to four years old had the highest discharge rate, 138 per 10,000 persons compared to a rate of 85 for five to nine year olds, (68) for 10 to 14 year olds, and (93) for 15 to 19 year olds.

The risk of injury by age and sex

Among children less than five years of age, there were no significant male/female differences in death rate. However, across all other age groups, males consistently demonstrated a higher death rate from injuries than females; for five to nine year olds the death rate among males was 2.5 times the female rate (3.1 v 1.2), and three times the female rate (4.7 v 1.5) among 15 to 19 year olds.

Hospitalization rates by age and sex were calculated. Male hospitalizations were observed at a rate of 117 per 10,000, roughly 60% above the female rate (73). Across all age groups, males demonstrated a higher rate than females. For adolescents 15 to 19 years old, the male hospital discharge rate (130/10,000) was over twice as great as the female rate (57/10,000).

INJURY RATES PER 10,000 PERSONS
BY AGE, HARTFORD RESIDENTS



N=76
Source: Connecticut Vital Statistics 1980-86

N = 2220
Source: Connecticut Hospital Association 1982-86

Figure 3

Causes of injury mortality

From 0 to 19 years, homicide was by far the leading injury-related cause of death, accounting for 43% of fatalities. Motor vehicle-pedestrian collisions accounted for 11% of injury deaths, motor occupant (9%), drowning (8%), and burns (7%) (Figure 4).

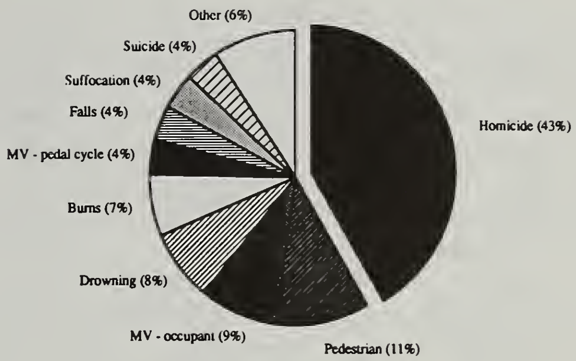
When viewed by specific age group, homicide was the leading cause of death among infants less than one year and adolescents 15 to 19 years. Firearms were used in 46% of all homicides. Other leading homicide methods were stabbing with knives or other sharp instruments (24%), child abuse (18%), and strangulation (6%).

Causes of injury morbidity

During the five-year study period, 43% (950 of 2,220) of injury discharges had an associated E-code. Ninety-six percent of injury discharges for Hartford residents occurred from the three acute care hospitals within Hartford city limits (Hartford Hospital, St. Francis Hospital and Medical Center, and Mt. Sinai Hospital).

Of those discharges for which E-coding was performed, falls were the leading cause of injury-related hospitalization accounting for 22% of all discharges, but the following observations were noted when considering age and cause. Among infants less than one, falls (50%), burns (20%), and assault (12%) were the leading causes of hospitalizations; for children one to four years poisoning (35%), falls (22%), and burns (18%) predominated; for children five to nine years, falls (39%), pedestrian (22%), and pedalcycle nonmotor vehicle (18%); for 10 to 14 year olds, falls (21%), struck by object (14%), and self-inflicted (13%); and for adolescents 15-19 years, self-inflicted (17%), motorcycle (11%), and falls (10%). Overall, limb fractures or dislocations (20%) and head injury (19%) emerge as the leading types of injury hospitalization.

PERCENT OF INJURY DEATHS
BY CAUSE,
0 - 19 YEARS, HARTFORD 1980-86



N = 76

Source: Connecticut Vital Statistics

Figure 4

Table 1 compares the leading causes of injury-related deaths and hospitalizations. Overall, falls were the leading cause of injury hospitalizations accounting for 22% of discharges, whereas homicide was the leading cause of mortality accounting for 43% of all deaths.

Poisonings (12%) and pedestrian injuries (8%) ranked second and third respectively as causes of injury hospitalization compared to pedestrian (11%) and motor vehicle occupant (9%) as causes of death.

The risk of injury by place of residence

High-risk geographic areas within Hartford were identified by the victim's place of residence. Hartford may be divided geographically by several methods, its 17 neighborhoods, six residential zip codes, or 49 census tracts. There were several neighborhoods that accounted for the majority of injury deaths: Clay-Arsenal (23%), Northeast (17%), and Frog Hollow (10%). Census tract 5009 which is included in the Clay-Arsenal neighborhood by itself accounted for 10.9% of injury deaths.

Two zip codes (06112, 06120) encompassing the northeast neighborhoods accounted for 26% and 21% of all hospital discharges respectively. Zip code 06106, capturing the southwest neighborhoods, accounted for 34% of all discharges.

Time trends

The time trends reported here reflect the date of death, not the date of injury occurrence, and must be inter-

Table 1
Morbidity vs Mortality
by Cause and Age, Hartford

	*Hospitalizations**			*Deaths***		
Age	*Cause*	*No.*	*Percent*	*Cause*	*No.*	*Percent*
<1	Falls	80	50%	Homicide	4	44%
	Burns	32	20%	MV-occupant	1	11%
	Assault	19	12%	Falls	1	11%
1-4	Poisoning	200	35%	Homicide	2	15%
	Falls	125	22%	Pedestrian	2	15%
	Burns	103	18%	MV-occupant	2	15%
5-9	Falls	167	39%	Pedestrian	6	40%
	Pedestrian	94	22%	Homicide	4	27%
	Pedalcycle non-mv	30	7%	Burns	2	13%
10-14	Falls	81	21%	Homicide	3	43%
	Struck by object	54	14%	MV-pedalcycle	2	29%
	Self-inflicted	49	13%	Suicide	1	14%
15-19	Self-inflicted	115	17%	Homicide	20	61%
	Motorcycle	75	11%	MV-occupant	4	12%
	Falls	68	10%	Motorcycle	2	6%
Total	Falls	488	22%	Homicide	33	43%
	Poisonings	266	12%	Pedestrian	8	11%
	Pedestrian	187	8%	MV-occupant	7	9%

* Source: Connecticut Hospital Association 1982-86 (N=2220)
** Source: Connecticut Vital Statistics 1980-86 (N=76)

preted accordingly. Injury deaths were highest in July (23.7%) and lowest in November (2.6%).

The cost of injuries

The importance of health problems to society can be appreciated by measuring the dollar costs of their effects, such as lost productivity (indirect costs to society) and the use of medical and other resources (direct costs to society).

One measure of society's loss is represented by years of potential life lost (YPLL) due to death. YPLL is a useful indicator because it not only reflects the number of deaths from a particular condition, but also the fact that these deaths have occurred early in life (before age 70). Each year, 11 deaths are attributable to injury resulting in an age-specific death rate of 2.3 (+/-1.4 at 95% CI) and 651 YPLL.

The total charges for 420 injury inpatient discharges utilizing 2,208 hospital days in 1986 exceeded $1.4 million dollars. Routine room and board charges accounted for $512,618, critical care charges (89,189), emergency department charges ($79,505), and other ancillary charges ($795,335).

Medicaid was listed as the primary expected payment source for 51% of acute care injury-related discharges. Commercial insurance (21%), self-pay (14%), and Blue Cross (11%) were other payment sources.

Discussion

The number of deaths per year is commonly used to describe and compare public health problems within specific populations. When one considers all diseases, the magnitude of the problem is apparent. Injuries are the leading cause of death among Hartford residents one to 19 years of age as they are among residents in other parts of the United States.[2] The injury death rate observed among Hartford residents 0 - 19 years (2.3 per 10,000 persons) is identical with the Connecticut injury death rate of 2.3 per 10,000[6] and compares closely with the United States injury death rate of 3.0 per 10,000.[7]

The number of people who are admitted to hospitals for treatment provides another basis for comparing health problems. Our results show that injuries are a major cause of hospitalization, second only to respiratory diseases. The injury hospitalization rate observed among Hartford residents 0-19 years (950 per 100,000) is 30% higher than the Connecticut hospitalization rate (724 per 100,000).[8]

Our data reveal that for every injury resulting in death there are 40 serious enough to warrant hospital admission. This observation is similar to the results of a childhood injury study in Massachusetts which revealed a ratio of one death to 44 hospital discharges.[9] Thus deaths are only the tip of the iceberg and represent a small proportion and only one aspect of the injury severity spectrum.

Relying only on injury fatality statistics as the primary source of information used to characterize the nature and magnitude of the injury problem may also distort the true pattern of injury morbidity. Our results are consistent with two large-scale, population based studies, the Statewide Childhood Injury Prevention Program[9] conducted in Massachusetts and the Northeast Ohio Trauma Study,[10] which showed that injury incidence and outcome cannot be derived simply by extrapolating from mortality data. The leading causes of nonfatal and fatal injuries are clearly different. For example our data indicate that falls are the leading cause of hospitalization whereas homicide is the leading cause of traumatic death. Were outpatient injury visits to be assessed, the leading cause might be still different from the other two groups. Therefore, in setting goals for injury prevention programs, it is important to define the severity level as well as the causes of injuries to be targeted for intervention.

While the risk factors of injury epidemiology are complex, some general patterns emerged from our study. Age-group differences in the magnitude and cause of injuries reflect differences in developmental level and exposure to hazards. For example, both fatal and nonfatal motor vehicle-pedestrian collisions were highest among five to nine year olds. The inability to assess distances and speeds and localize sounds adequately, combined with the normal impulsiveness of young children, leads to unsafe traffic behavior by children 11 or 12 years of age.[11,12]

As another example, infants under one are rarely poisoned, but the incidence of hospitalization increases markedly among children between one and four years. Advancement in motor skills, curiosity about the environment, and lack of insight into cause and effect relationships all contribute to the likelihood of unintentional poisoning. By school age, these risks abate and the incidence of poisoning drops markedly. Intentional poisoning increases in adolescence, as risk-taking behavior, denial of personal risk, and situational depression occur.

Patterns of injury may differ between urban and rural environments as well. Our data are consistent with other reports that show that motor vehicle-pedestrian injury is primarily an urban problem. Rivara *et al* reported that urban census tracts with a higher degree of individual family and neighborhood crowding resulted in higher pedestrian injury rates.[11] He reasoned that crowding was an important factor resulting in more play time spent outside on city streets which increased exposure to motor vehicles and the subsequent risk of injury.

One of the most disturbing findings of this study is the number of homicides that are afflicting our young people. Homicide was a prominent cause of death among all ages particularly among infants less than one and adolescents between 15 and 19. Our results are consistent with other reports that cite homicide as a major cause of pediatric mortality.[13,14] It is likely that infant homicides are largely the result of child abuse, while adolescent homicides are the result of aggressive interpersonal disputes. An accurate understanding of the true patterns of homicide among children, the most serious crime committed against persons, is of vital importance to the public health community as well as law enforcement authorities.

One limitation of our data warrants comment. Injuries present a unique problem because two distinct systems are used for coding data — one based on the type or nature of the injury (N-code) and the other on its cause and apparent intent (E-code). E-codes are helpful because they identify how injuries happen. Both systems should be used, however, less than half (42.3%) of the injury hospital discharges in our current data base have an associated E-code. Knowledge of the causes of injuries is essential in targeting interventions to prevent specific injuries and measuring the effectiveness of injury control interventions. It is crucial that E-coding be performed routinely for all hospital injury discharges.

High quality data are essential for the planning, development, and evaluation of efforts to prevent injuries.[15] The current data base is useful for developing a priority list of injuries for intervention efforts. However, further refinements are necessary in order to address the lack of sufficient information regarding human, environmental, and product factors. In addition, details of the circumstances before, during, and after the injury event are desperately needed. The inability of the current data base to provide an estimate of the entire spectrum of injury severity, such as treatment and release from emergency departments and other ambulatory sites, is also recognized.

Conclusion

The purpose of this report has been to identify groups at high risk of injury and to describe patterns of injury in these groups. In so doing, we not only refine our understanding of injury as a public health problem, but also provide baseline data to monitor national objectives for injury prevention.[16] In addition, a surveillance methodology has been developed which can evaluate the effectiveness of future interventions. This report helps to clarify the magnitude of the injury problem for Hartford children and identifies several causes which may be the target for future interventions.

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Microvascular Free-Flap Reconstruction of a Large Defect of the Scalp

Experience in a Community Hospital

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AND CHARLES W. NEEDHAM, M.D.

ABSTRACT—The authors present a patient who had postradiation necrosis of the skull and scalp measuring over 300 cm square which was reconstructed with a free latissimus dorsi muscle flap with overlying skin grafts. The procedure was performed in a community hospital with a team comprising two plastic surgeons and a neurosurgeon, with backup from physicians assistants and nursing staff. The successful outcome of this procedure was a direct result of the concerted effort of the surgical team. We believe that microvascular free-flap reconstruction, although a complicated procedure, can be performed at the community hospital as long as appropriate measures for the care of the patient are planned and carried out.

Introduction

SCALP defects with exposure of the dura and/or calvarium represent a difficult problem in reconstructive plastic surgery. Local flaps and skin grafts can be used when small defects are involved.[1] However, with large defects, including exposed dura or brain, the only methods of reconstruction have heretofore been staged distant pedicle flaps. Despite these methods, however, routine satisfactory reconstruction of these defects remained elusive till the advent of the newer techniques of microsurgery.[2,4,8,9]

With advances in neurosurgery, anesthesia, and reconstructive plastic surgery, some conditions previously untreatable have now become treatable. Massive lesions of the scalp, tumors invading dura and brain, even the sagittal sinus can be successfully removed by surgical techniques.[8] The resulting defect, leaving exposed areas of the brain or dura, can now be reconstructed immediately using microsurgical techniques.[8,9] The use of a free muscle flap has been found to be a most reliable technique.[7] Properly vascularized muscle has the ability to overcome potential infection and can revascularize bone.[3] This property of muscle seems to be superior to that of skin flaps.[3]

The patient presented here is a 60-year-old woman admitted because of complications of radio-osteonecrosis of the scalp and skull. She had had three craniotomies in the past for a frontoparietal meningioma, which involved the middle third of the sagittal sinus. The craniotomies resulted in debulking of the tumor; however, the tumor recurred. In 1986 she received radiation therapy for the recurrent tumor, and in 1987 she was seen for what appeared to be a chronically draining sinus through the frontal scalp. Examination revealed evidence of a previous craniectomy in the frontoparietal area with a thin atrophic layer of skin overlying the dura. At the left anterior side of the thinned skin, there appeared to be a small opening through which purulent material was draining; cultures of this exudate showed *Staphylococcus aureus.* She was treated with massive doses of oxacillin intravenously following which the infection subsided. Subsequently, she underwent several reconstructive procedures with local skin flaps in order to cover the dural defect. While a portion of the skin flaps survived and covered the small dural defect, additional skin erosions occurred exposing an area of frontal skull. Betadine irrigation was utilized to prevent further erosion or infection, but wound healing continued to be difficult, especially in the areas of irradiation.

The decision to do a reconstruction utilizing a free latissimus dorsi flap was made. A preoperative computed tomographic scan revealed no evidence of further growth of the meningioma, and there was no evidence of penetration of the skull by tumor. She was in good general health prior to surgery.

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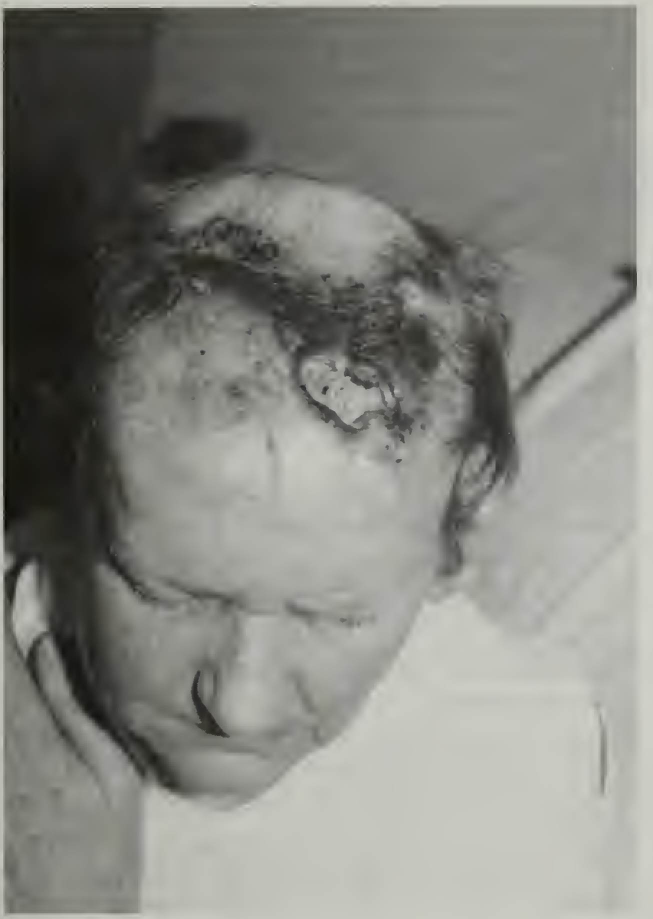

Figure 1

Preoperative condition

Under general endotracheal anesthesia, debridement and craniectomy of devitalized bone was performed by the neurosurgeon. In addition, the skin directly overlying the dura was excised. The defect of the skull measured 15 x 20 cm. The temporal vessels on the left side were then identified utilizing the microscope; this was followed by dissection of the latissimus dorsi muscle flap which was isolated on the thoracodorsal artery and vein. The free latissimus dorsi muscle flap was then transferred into the defect anastamosing the thoracodorsal vessels to the left superficial temporal vessels. Two venous anastomoses and one arterial anastomosis were performed. The muscle was covered with a meshed skin graft. The preoperative condition is shown in Figure 1 and the intraoperative appearance in Figure 2. To reduce arterial clotting on the radiation damaged intima of the artery, heparinization was required. Monitoring of the flap hourly for the first 72 hours was necessary. After 10 days survival of the flap seemed assured, and heparinization was discontinued and the patient was given aspirin. She left the hospital 12 days following her surgery. The postoperative result approximately two months laters is shown in Figure 3.

Discussion

The advantages of free-flap reconstruction of the scalp utilizing latissimus dorsi muscle flap and overlying skin graft have been discussed in previous publications.[2,8,9] Other free flaps including scapular, groin, as well as inferior rectus muscle have been utilized.[2,5,8] The advantage of muscle flaps over skin flaps has been discussed previously in the literature.[2,3,5] The latissimus dorsi muscle flap satisfies criteria for excellent reconstruction in the area of the scalp.[8,9] Plastic surgeons who have had additional training in microvascular surgery possess the technical capability involved in performing this type of reconstruction. In order to maintain technical proficiency, the following facilities must be made available to the reconstructive plastic surgeon: a laboratory where practice vascular anastomoses may be performed frequently enough to maintain dexterity, updated equipment such as an operating microscope, microvascular instrumentation, and monitoring equipment such as the laser dopler and temperature probes which aid in the postoperative observation of the flap. The most important ingredient, however, is a commitment on the part of the surgeons, as well as the hospital staff, to the care of the patient.

Over the past 15 or more years since microvascular surgery has been performed in this country, advances have been made in applications in reconstructions of numerous locations. In the hand, microvascular surgery has been used to create digits and cover areas where other types of reconstructive techniques are not feasible. Acutely or chronically exposed bone of the lower extremities has been salvaged using microvascular free-flap

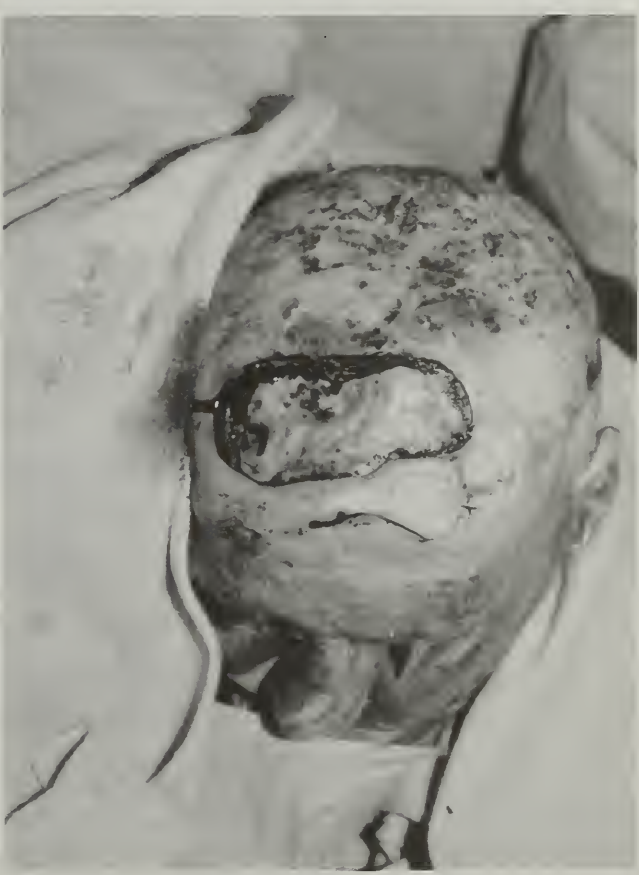

Figure 2

Intraoperative post-debridement

techniques. Major bone and soft tissue loss in the head and neck areas have been reconstructed using microvascular free flaps such as the one we have described.[7,8] Improvement in surgical technique and monitoring has enabled better results in recent years.[2,6]

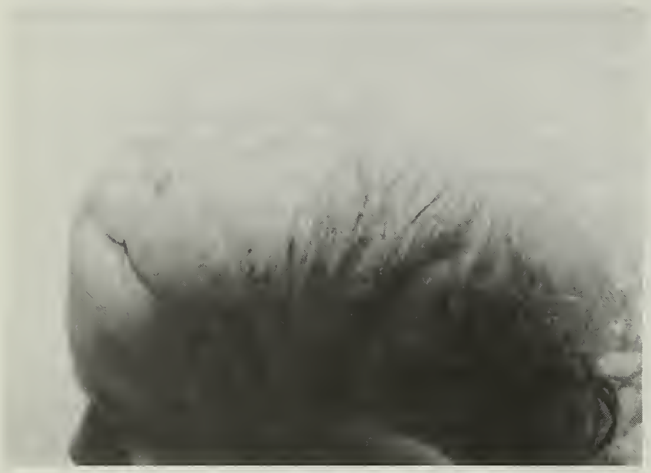

Figure 3

Postoperative condition

In conclusion, we have presented a patient who had sustained radiation necrosis of the scalp and skull and in whom a free microvascular latissimus dorsi muscle flap was utilized to reconstruct a large defect. The procedure was performed with success in a community hospital setting utilizing the services of two microsurgeons and a neurosurgeon, as well as the backup of a surgical physician's assistant staff and nursing staff. We believe that microvascular procedures for reconstruction of the head and neck, lower extremity and hand and other difficult areas of the body can be performed with successful results in the community hospital.

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Severe Neutropenia With Procainamide Therapy

HERBERT S. HOFFMAN, M.D.

SEVERE thrombocytopenia resulting from quinidine therapy is a well-known clinical entity. Less familiar but equally life-threatening is a severe neutropenia associated with procainamide, which is in frequent use to treat ventricular arhythmias.

A recent patient study illustrates this presentation and its complications. Mr. Z. is a 76-year-old white male who underwent coronary artery bypass grafting following the diagnosis of unstable angina and a subendocardial myocardial infarction. Several days later he suffered a postoperative cardiac arrest due to ventricular fibrillation which was rapidly reversed. He was then given aspirin and procainamide hydrochloride in sustained release tablets (Procan-SR), a total of 2.5 g per day. During his recuperation he had a syncopal episode and a bout of pericarditis. This difficult perioperative period was accompanied by a 20 pound weight loss, but he seemed to be doing well two months after surgery when he noted several shaking chills during a two-day period accompanied by nausea and occasional diarrhea. A loose tooth fragment under his upper denture was noted and was removed by a dentist by "simply wiggling it loose," and penicillin prophylaxis was prescribed. The following day he was examined in the office and found to have a fever of 102° F, and a purplish indurated and swollen external hemorrhoid surrounded by a ring of ischemic tissue. He was admitted to the hospital and was given a single 750 mg dose of procainamide before it was discovered that his white blood cell count (WBC) was 200, with 4% neutrophils, 92% lymphocytes, and 4% monocytes; hematocrit was 31%, mean red cell volume 83; platelets were 160,000. Two weeks prior to admission, he had had a normal WBC; he had also had a hematocrit of 31%, procainamide and N-acetyl procainamide (NAPA) values in the therapeutic range, as well as a negative antinuclear antibody test. At no time during this illness did he note a rash. The day after admission, a bone marrow aspirate revealed a "hypocellular marrow, with marked reduction of granulocyte and erythroid precursors"; megakarocytes were normal. Transfusion of granulocytes was initiated and continued daily for nine days. A trial of lithium carbonate for several days was considered ineffective and it was discontinued. Blood tests for antihistone antibodies and indirect Coombs were negative. A day after discontinuance of procainamide, his procainamide level was 21 (4-8 normal) and NAPA was 2.1 (5-30 normal); there were associated procainamide-toxic electrocardiographic changes. Antinuclear antibodies (ANA) testing was negative a week after admission. Because of initial sepsis, an intravenous course of mezlocillin and tobramycin therapy was maintained. The day after admission, blood cultures were positive for two gram-negative species, subsequently identified as *E. coli* and *Klebsiella pneumoniae.* He developed a necrotic perianal area exacerbated by recurrent diarrhea; and metronidazole hydrochloride (Flagyl) was added to his antibiotic regimen. A computed tomographic scan of his abdomen and pelvis, as well as abdominal ultrasound, did not reveal any extension of the perianal abscess. The remainder of his physical examination was unremarkable, and it was decided to postpone surgical debridement until he had a higher WBC. The perianal area remained indurated, painful, without clear fluctuance, but did not appear to spread despite the severe neutropenia which did not reverse for about nine days. Two weeks after admission, the abscess was debrided, as it had begun to drain spontaneously. At this time, his WBC was nearly normal at 4,600, with a differential of 43% neutrophils, 23% band forms, 24% lymphocytes, and 9% monocytes. The progression of his WBC was as follows: day one, 200; day three, 283; day nine, 900; day 10, 1,200; day 11, 1,400; day 13, 3,600; day 14, 4,300. He became fever-free 11 days after admission. Blood cultures, as well as stool and urine cultures, were negative five days after admission. After two weeks of intravenous antibiotic therapy, ciproflaxin was added to Flagyl to continue an oral regimen. The persistent diarrhea seemed to resolve at this point. Because of vigorous intravenous fluid administration, the patient suffered an acute

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bout of pulmonary edema which responded to furosemide (Lasix) therapy, as well as diltiazem hydrochloride (Cardizem). He was discharged in good condition on day 17 of his hospitalization.

Discussion

The first report of agranulocytosis associated with procainamide therapy appeared in 1951.[1] In subsequent years, several other instances were reported, but after the widespread use of a long-acting drug, starting with the marketing of Procan-SR in 1981-82, a greater frequency of such cases became evident.[2-9] One of the earliest reports to recognize this association was that of Berger and Hauser at Mount Sinai Hospital, Hartford.[2] The sustained release preparations maintain a therapeutic level of serum procainamide and its metabolites longer but the greater apparent incidence of cases may in fact reflect only the greater prevalence of clinical use of Procan-SR. Instances have occurred with both types of preparation, and one patient was noted to develop nearly identical agranulocytosis on separate courses of a short-acting and long-acting form of procainamide hydrochloride taken five years apart.[4] Patients have been predominantly white, both male and female. One study of all nonsurgical patients showed an incidence of 0.55%,[8] with little difference between conventional or sustained release preparations. By comparison, patients after cardiovascular surgery on sustained-release procainamide suffered a 4.4% incidence.[3] The sudden granulocytopenia was found generally within the first three months on medication. It developed rapidly and resolved spontaneously with discontinuation of the medication, usually within four to 16 days. There was a high rate of survival with vigorous medical support, but a significant number of fatal outcomes occurred. The clinical presentation was typically an acute onset of a high fever and symptoms of sepsis. Usually the serum level of procainamide and NAPA was not in the toxic range, and the ANA test was negative. An occasional patient, after prolonged therapy, developed a lupus-like syndrome, with a high ANA value, positive LE prep, and a positive Coombs test. Only rarely was thrombocytopenia associated with leukopenia, and mild anemia was typically of a chronic disease nature. Bone marrow usually revealed myeloid hypoplasia or maturation arrest at various stages of myeloid differentiation. The mechanism of this bone marrow depression may be related to an antibody to procainamide or T-lymphocyte suppression of granulopoiesis or perhaps a direct toxic effect of the benzene-like structures of procainamide on nucleic acid synthesis.[10] There may also be a concomitant effect of reduced granulocyte survival peripherally. However, antileukocyte antibodies have not been detected, and only rarely have autoantibodies been reported (ie, lupus-like syndrome).

Because a predominantly immune mechanism is not likely, the value of steroid therapy is questionable; it may in fact impede the resolution of sepsis or an abscess. Broad-spectrum antibiotic therapy is essential. Occasionally an anal or vulvar abscess has been described as part of the clinical presentation, which has healed without surgery as the white count rallied. Such perirectal infections are commonly seen with hematologic malignancies (eg, acute leukemia[11]). The lesions are painful and indurated but without fluctuance. Bacteremia is frequent, usually involving enteric organisms. Cultures may indicate mixed flora, including anerobes. Often the only predominant organism is *Pseudomonas aeruginosa.* The literature reports favor early incision and drainage, especially in the presence of persistent fever, a failure to drain spontaneously, or signs of urinary retention, peritoneal signs, or extension to genitalia.

The issue of granulocyte transfusion is controversial.[12] Generally, with persisting leukopenia, there is agreement on the role for this therapy in two instances: (1) gram-negative sepsis, and (2) chronic granulomatous disease with life-threatening infections unresponsive to antibiotic therapy. The most important factor in survival appears to be a return to a level of greater than 1,000 WBC per ml. Granulocyte transfusions in these circumstances sometimes cause chills and fever or pulmonary infiltrates. These infiltrates may be related to sequestration of white blood cells in lung infections or perhaps to fluid overload.

The almost ten-fold increase in the incidence of agranulocytosis with procainamide therapy after cardiovascular surgery has prompted speculation that a blood-transmitted cytomegalovirus (CMV) infection is responsible.[13] CMV infection is apparently widespread (and usually benign) as evidenced by positive antibody serology in many adults in the United States. Reactivation of CMV infection may thus occur in seropositive patients who are debilitated after such major surgery. Our patient had a titer of 1:64 for CMV antibody 10 months after this hospitalization. In renal transplant patients, a syndrome of CMV infection accompanied by profound leukopenia usually leads to superinfection and death.[14] However, a rubelliform rash has not been noted with procainamide therapy, nor has the relative atypical lymphocytosis that is characteristic of CMV infection in the nonimmunocompromised patient. Nevertheless, any suspected case might prompt a culture for CMV of urine or of a white cell buffy coat.

Because of the life-threatening severity of the neutropenia associated with any form of procainamide therapy, it is prudent to obtain a complete cell count regularly during the first several months after initiation of therapy. This is especially indicated following cardiovascular surgery. Patients should be instructed to be alert for any unexplained fever or toxic manifestations.

Acknowledgment

The dedicated care of the team of doctors that was instrumental in the patient's full recovery is gratefully acknowledged. I would like to thank the following also for many helpful conversations, sometimes at less than convenient hours: Drs. George Anastasia, Panos Livadiotis, Jeffrey Wasser, Lynn Davis, Robert Lyons, and Eytan Rubenstein.

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Living Wills

Living wills specifiy patients' wishes regarding life-support treatment if they become comatose. Should physicians have "living wills" available in their offices for patients' use or not?

Physician Opinion 1988		
	Yes	64%
	No	25
	Unsure	11

Approximately two of three physicians supported the concept of having living wills available in their offices; 25% expressed opposition. Also noteworthy was that three of four general practitioners and radiologists showed support, while only 50% of surgeons did so. Again, physicians who had been involved in life support decisions were more likely to favor having living wills available than were those MDs who had not been involved.

Increasingly sophisticated technology has given medical personnel greater ability than ever before to prolong life, but this potential has brought with it questions about the desirability of doing so under certain conditions. The 1986 public survey addressed this issue.

Would you favor or oppose withdrawing life-support systems, including food and water, from hopelessly ill or irreversibly comatose patients if they or their families request it?

Public Opinion 1986		
	Favor	73%
	Oppose	15
	Unsure	12

Almost three-fourths of the respondents said they would favor withdrawing life support under these conditions. Although many respondents may not have associated this issue with the AMA, their opinions represented a landslide of public support for the position taken in March of 1986 by the AMA's Council on Ethical and Judicial Affairs. Persons with higher levels of education and income were more likely to favor this position than were those with less. Opposition to the idea was somewhat greater among respondents 65 years of age and older than among those who were younger.

— The full results of the survey appear in the *AMA Physician and Public Attitudes on Health Care Issues*, 1989 edition.

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DRUG INFORMATION UPDATE: HARTFORD HOSPITAL

Management of Digitalis Intoxicated Patients Following the Administration of Digoxin FAB Antibodies (Digibind®)

MICHAEL UJHELYI, PHARM.D.

Introduction

DIGOXIN continues to be extensively prescribed for the treatment of congestive heart failure and atrial dysarrhythmias. With its narrow therapeutic index, toxicity is seen quite frequently.[1,2] This has led to the development of digoxin-FAB antibodies (FAB). It is a specific antidote that quickly and effectively removes digoxin from the body. Thus, the use of FAB can be a life saving intervention.

Pharmacology

FAB is obtained from sheep serum after being immunized with digoxin molecules coupled to an antigenic hapten. FAB is a protein that has a smaller molecular mass, less antigenicity, greater distribution volume and a faster elimination than its parent IGG antibody. FAB has a high affinity for digoxin. Thus, after the administration of FAB, digoxin is quickly removed from its pharmacologically active binding site (adenosine triphosphatase) and sequestered into the extracellular fluid. Hence, the signs and symptoms of digitalis intoxication are reversed in a matter of minutes.

Patient Monitoring

ECG Monitoring

After FAB has been administered (see indication, dosage, and monitoring guidelines in Figure 1) the patient should be closely monitored. Resolution of life threatening arrhythmias should occur approximately 20-40 minutes following the end of the FAB infusion.[2] In patients with normal renal function, it will take approximately 48-72 hours for the digoxin-FAB complex to be cleared from the body (half-life, 20 hours).[3] In the presence of severe renal dysfunction (serum creatinine > 3.8 mg/dl), this time period has been reported to be two to seven times longer.[4,5] During this crucial time period, equilibration usually occurs between the free (pharmacological active) serum digoxin and FAB bound digoxin with a resulting rise in the free serum digoxin concentration (SDC). However, in most cases this is a clinically insignificant event. When a more pronounced rebound in the free SDC produces reintoxication, it has been associated with an inadequate FAB dose.[3] The rise in free SDC usually occurs within 12-24 hours after the FAB dose in patients with normal renal function. Based on a limited number of case reports, this phenomenon occurs 48-72 hours post FAB dosing in patients with severe renal dysfunction.[4,5] It is postulated that equilibration and a subsequent rise in the free SDC is related to the elimination rate of the FAB. Therefore, it is recommended that these patients should be monitored electrocardiographically for the time periods when the digoxin-FAB complex is present in the serum. It is important to remember that SDC levels are meaningless during this time period.

If the arrhythmias do not subside after FAB administration one should consider: 1) the validity of the elevated serum digoxin concentration (ie, obtained after four hours of digoxin administration, and through an intravenous site that was not used to administer digoxin) 2) electrolyte abnormalities such as hypokalemia or hypomagnesemia, and 3) administration of other proarrhythmic agents. After ruling out the above possibilities additional FAB should be administered along with aggressive conventional therapy.

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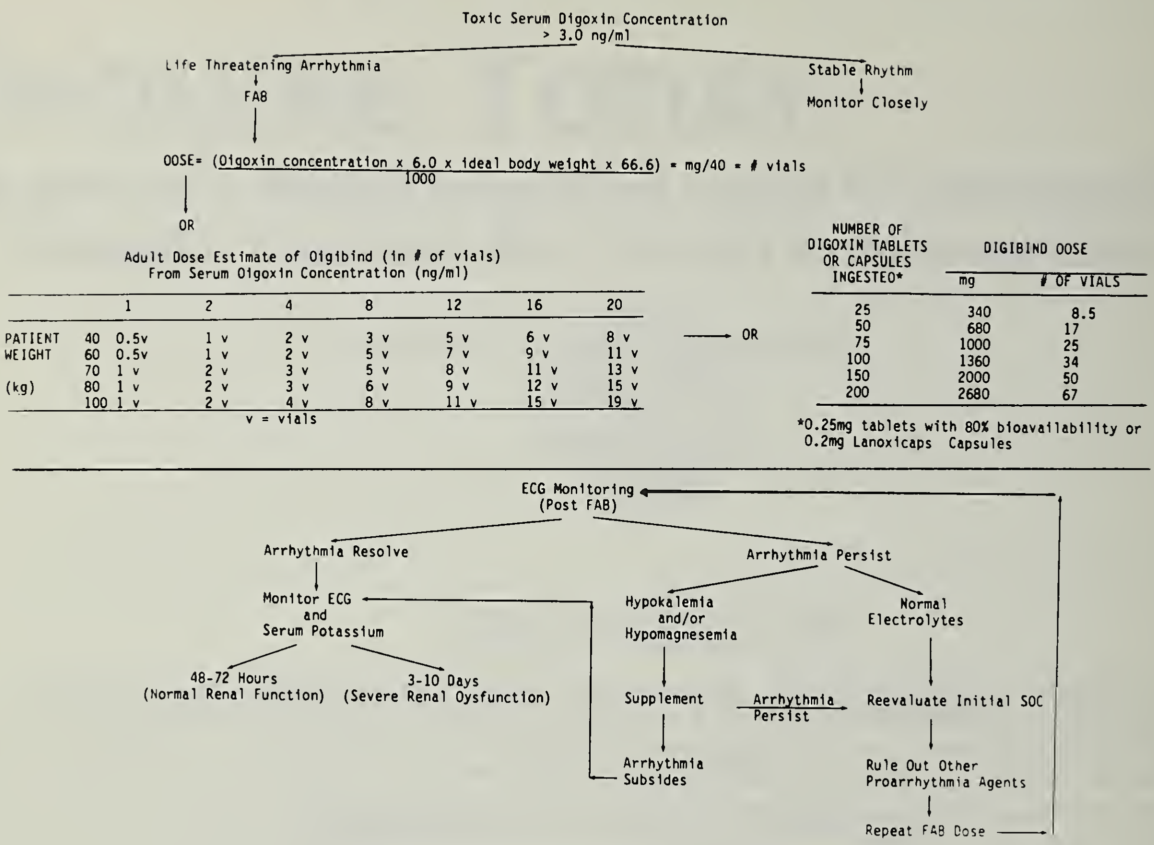
This series on Drug Information Updates from Hartford Hospital are provided by the Drug Information Center, Department of Pharmacy Services, Hartford Hospital.

Editors: Moses Sing Sum Chow, Pharm.D., and Robert A. Quercia, M.S., R.Ph.

FIGURE I
INDICATION, DOSAGE AND MONITORING GUIDELINES FOR FAB (9)



DOSE= $\frac{\text{(Digoxin concentration x 6.0 x ideal body weight x 66.6)}}{1000}$ = mg/40 = # vials

Adult Dose Estimate of Digibind (in # of vials)
From Serum Digoxin Concentration (ng/ml)

		1	2	4	8	12	16	20
PATIENT	40	0.5v	1 v	2 v	3 v	5 v	6 v	8 v
WEIGHT	60	0.5v	1 v	2 v	5 v	7 v	9 v	11 v
	70	1 v	2 v	3 v	5 v	8 v	11 v	13 v
(kg)	80	1 v	2 v	3 v	6 v	9 v	12 v	15 v
	100	1 v	2 v	4 v	8 v	11 v	15 v	19 v

v = vials

NUMBER OF DIGOXIN TABLETS OR CAPSULES INGESTED*	DIGIBIND DOSE	
	mg	# OF VIALS
25	340	8.5
50	680	17
75	1000	25
100	1360	34
150	2000	50
200	2680	67

*0.25mg tablets with 80% bioavailability or 0.2mg Lanoxicaps Capsules

Serum Potassium Monitoring

Hyperkalemia occurs commonly with severe acute digitalis intoxication secondary to the poisoning of the sodium-potassium adenosine triphosphatase pump by the drug. It is important to recall that potassium will protect against digoxin toxicity. However, if the serum potassium concentration rises acutely, greater than 2-3 meq/L above baseline, life threatening arrhythmias may be provoked. Following FAB, the acutely elevated serum potassium concentration quickly resolves. Serum potassium concentrations should be monitored closely for the first 78 hours since hypokalemia may ensue secondary to total potassium depletion.[6]

Serum Digoxin Monitoring

It is imperative that serum digoxin concentration *not* be obtained post FAB infusion. Most assays are adversely affected by FAB resulting in erroneous concentrations that are usually 10-30 fold *higher* than the pre-FAB concentration.[2,7] This includes the radioimmunoassay which is used at our institution. Thus, serum digoxin levels should not be ordered until the FAB has been completely cleared from the body (usually 48-72 hours in patients with normal renal function and three to 10 days in patients with severe renal dysfunction). The ability of several clinical digoxin assays to quantitate free serum digoxin concentrations reliably following FAB therapy are currently being investigated.[8]

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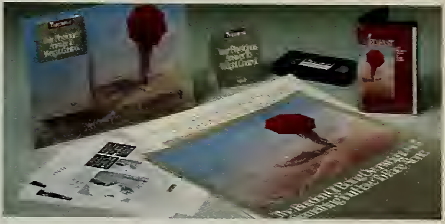

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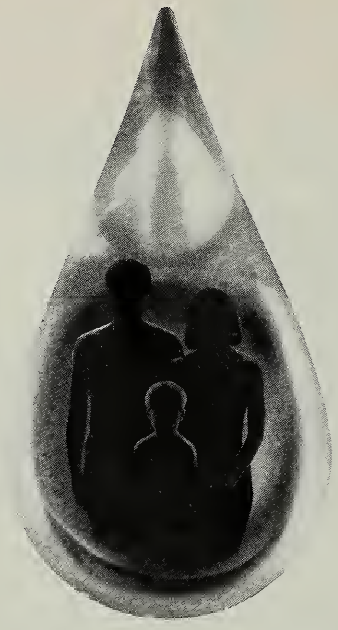

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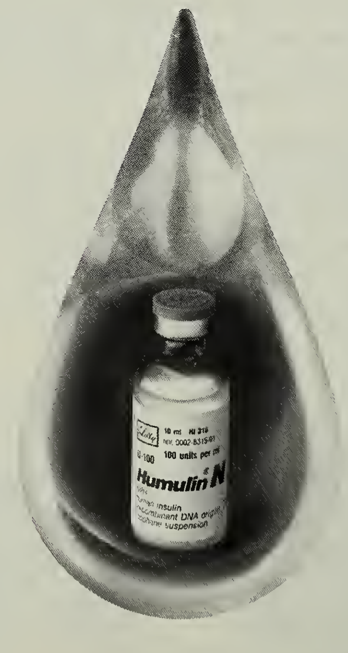

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CONSENSUS CONFERENCE

Treatment of Destructive Behaviors in Persons with Developmental Disabilities

NATIONAL INSTITUTES OF HEALTH

DEVELOPMENTAL disabilities encompass many diagnostic categories; there are nearly four-million people in the United States with such disabilities.* The largest number of individuals with developmental disabilities are persons with mental retardation. This consensus statement is concerned with the treatment of severe destruction behaviors in persons with developmental disabilities that may be injurious to self or others or destructive of property. Most practitioners agree that serious destructive behavior is a major although uncommon problem among persons with developmental disabilities and one that cannot be ignored. Some methods of treatment, however, remain controversial.

Destructive behavior is defined as conduct that, due to its intensity and/or frequency, presents an imminent danger to the person who exhibits the behavior, to other people, or to property. Accordingly, intervention is necessary for the safety of the individual engaging in the destructive behavior, for those against whom the aggression is directed, and for the protection of property.

Seriously destructive behaviors can take unusual forms among persons with developmental disabilities, especially those with mental retardation. The range and form of these behaviors are broad, and they vary in severity, duration, and intensity. In some cases, 24-hour observation, supervision, and treatment are essential to protect individuals from self-injury or from injuring others.

The National Institute of Child Health and Human Development (NICHD) and the Office of Medical Applications of Research (OMAR), National Institutes of Health (NIH), sponsored the Consensus Development Conference on Treatment of Destructive Behaviors in Persons with Developmental Disabilities. They were joined by the National Institute of Neurological Disorders and Stroke, the National Institute of Mental Health of the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), and the Division of Maternal and Child Health of the Health Resources and Services Administration.

After the scientific basis of the topic was defined, a formal planning meeting was held. The planning committee included a parent of an individual with a developmental disability, other expert consultants, and representatives from the following agencies:

---

*1. Public Law 100-146—1 October 1987.

"The term 'developmental disability' means a severe, chronic disability of a person which:

(A) is attributable to a mental or physical impairment or combination of mental and physical impairments;

(B) is manifested before the person attains age twenty-two;

(C) is likely to continue indefinitely;

(D) results in substantial functional limitations in three or more of the following areas of major life activity: (i) self-care, (ii) receptive and expressive language, (iii) learning, (iv) mobility, (v) self-direction, (vi) capacity for independent living, and (vii) economic self-sufficiency; and

(E) reflects the person's need for a combination and sequence of special, interdisciplinary, or generic care, treatment, or other services which are of lifelong or extended duration and are individually planned and coordinated."

NIH Consensus Development Conferences are convened to evaluate available scientific information and to resolve safety and efficacy issues related to a biomedical technology. The resultant NIH Consensus Statements are intended to advance understanding of the technology or issue in question and to be useful to health professionals and the public.

NIH Consensus Statements are prepared by a nonadvocacy, nonfederal panel of experts based on (1) presentations by investigators working in areas relevant to the consensus questions during a $1\frac{1}{2}$-day public session; (2) questions and statements from consensus attendees during open discussion periods that are part of the public session; and (3) closed deliberations by the panel during the remainder of the second day and the morning of the third day. This statement is an independent report of the panel and is not a policy statement of the NIH or the federal government.

From the Office of Medical Applications of Research, National Institutes of Health, Bethesda, Md.

Reprint requests to Office of Medical Applications of Research, Bldg 1, Room 260, National Institutes of Health, Bethesda, MD 20892 (William H. Hall). Bibliography, prepared by the National Library of Medicine, is available from the same address.

- National Institute of Child Health and Human Development, NIH.
- U.S. Department of Education.
- Office of Medical Applications of Research, NIH.
- National Institute of Mental Health, ADAMHA.
- National Institute of Neurological Disorders and Stroke, NIH.
- Administration on Developmental Disabilities.
- Health Resources and Services Administration, DHHS.
- President's Committee on Mental Retardation.

The planning committee completed the following three tasks:

- Identification of disciplines to be represented on the panel and individuals from these disciplines who might serve as panel members.
- Formulation of consensus questions.
- Identification of topics of background papers and scientists qualified to develop the papers.

The consensus panel consisted of professionals representing a variety of scientific disciplines and included parents of children with developmental disabilities. No panel member was committed to a specific form of treatment for destructive behaviors.

The following questions served as the basis for this Consensus Development Conference:

1. What are the nature, extent, and consequences of destructive behaviors in persons with developmental disabilities?
2. What are the approaches to prevent, treat, and manage these behaviors?
3. What is the evidence that these approaches, alone or in combination, eliminate or reduce destructive behaviors?
4. What are the risks and benefits associated with the use of these approaches for the individual, family, and community?
5. Based on the answers to the above questions and taking into account (a) the behavior; (b) the diagnosis and functional level of the individual; (c) possible effects on the individual, family, and community; (d) the treatment setting; and (e) other factors, what recommendations can be made at present regarding the use of the different approaches?
6. What research is needed on approaches for preventing, treating, and managing destructive behaviors in persons with developmental disabilities?

The panel first convened in December 1988. Its members were presented with an extensive but preliminary bibliography search on treatment of destructive behaviors that explored six data bases. This bibliography was updated in August 1989. Detailed plans for the background papers were also presented.

In four subsequent panel meetings, background papers were presented by their authors and extensively discussed and reviewed by panel members.

According to the NICHD consensus conference design, a draft report was prepared by the panel to serve the sole purpose of providing a basis for the conference.

The NIH made a *broad effort* to involve the greatest number of interested participants. In January 1989 many organizations were identified by the panel and others and advised of the proposed conference. Notices were placed in major professional journals, including the *American Journal on Mental Retardation.* In July 1989 more than 13,000 announcements inviting participation were mailed to groups and individuals with an identified interest in this area. The *Federal Register* announcement appeared 4 August 1989. The draft report of the panel was distributed to all registrants, to organizations with a recognized interest in the area, and to any person who requested the document.

This consensus conference was an open-public meeting at which a summary of the draft report was presented by panel members. Additional data on a variety of treatment modalities were presented and discussed. The agenda also included testimony concerning the draft report from individuals and organizations. No individual or organization requesting to speak was denied the opportunity. All material received from respondents was distributed promptly to panel members. After the public meeting, panel members met to review and incorporate information received at the meeting into this consensus statement. The statement provides direct narrative answers to the proposed questions. Subsequent to the meeting the panel will revise the draft report to be consistent with the consensus statement, and the final report will be published as a monograph on the subject of the consensus conference.

1. What are the Nature, Extent, and Consequences of Destrutive Behaviors in Persons with Developmental Disabilities?

Destructive behavior is a major problem in persons with developmental disabilities. An estimated 160,000 individuals with developmental disabilities exhibited a significant degree of destructive behavior in the United States in 1988. The estimated total cost of care for these people exceeded $3 billion.

The two major categories of destructive behavior are self-injurious behavior (SIB) and aggression toward others or toward property. The most extreme cases involve those persons with serious SIB—perhaps 20,000 to 25,000 individuals. Their behaviors involve repeated self-inflicted, nonaccidental injuries producing bleeding, protruding and broken bones and other permanent tissue damage, eye gouging or poking leading to blindness, and swallowing dangerous substances or physical objects. SIB is especially perplexing because to observers the repeated self-infliction of pain seems so maladaptive and incomprehensible. Less serious for the individual, but potentially more dangerous for caregivers and family, are destructive behaviors involving repeated physical assaults that injure others. The treatment of all types of destructive behavior is difficult. In the context of concerns regarding personal freedom and dignity, many specific therapies have employed unusual and unique approaches. As a result, some methods employing physical or social restriction, aversive procedures, and psychotropic drugs are controversial.

SIB is a symptom in several rare genetic disorders, the best known being Lesch-Nyhan disease, which is caused by an enzyme deficiency. With respect to most nongenetic cases of SIB and other destructive behaviors, the specific initiating cause is seldom unknown. A number of theories ascribe the onset, development, and maintenance of destructive behaviors to a variety of causative factors. These include neuroanatomical, physiological, and chemical abnormalities; social and environmental deprivation; need for stimulation due to sensory deficits; and operant and respondent learning. In most cases it is difficult to determine the exact initiating causes due to a lack of pertinent longitudinal and diagnostic information. It is likely, however, that many of these theories are valid because for most individuals, with respect to conditions supporting the development and maintenance of the destructive behavior, multiple causes seem to be the rule.

Some aspects of destructive behavior are seen in most children at specific periods of development. For the person with a developmental disability, destructive behaviors, if left untreated, can persist for years or even decades and are often life threatening. Specific destructive behaviors do vary by age, sex, cognitive level, adaptive functional level, and residential environment. SIB is more prevalent in persons with severe-to-profound rather than mild-to-moderate retardation, and destructive behaviors in general are more prevalent in persons living in institutions compared with those in community residences.

Destructive behaviors result in five classes of consequences—physical, social, emotional, educational, and economic. By definition, destructive behavior carries the risk of serious bodily injury, which may result in permanent damage either to the person who enacts the behavior or to others. Fortunately, because of intervention, death is rarely a consequence. However, the wide range of SIB actions can result in pain, tissue and organ damage, infections, body disfigurement, and poisoning due to ingestion of toxic substances. Aggressive behaviors such as spitting, hair pulling, scratching, hitting, pinching, and kicking can cause pain as well as physical and emotional injury to both the giver and receiver of such aggression.

All forms of destructive behavior have serious social and personal consequences for people with developmental disabilities. These include isolation, resulting in separation from family members and peers, and deprivation of opportunities to develop normal social relationships. The negative attitudes developed by those witnessing destructive acts further hinder development of harmonious and effective interpersonal relationships. Of special importance, destructive behaviors distort, or render more negative, community attitudes toward the larger group of persons with disabilities, most of whom exhibit no destructive behaviors. Social isolation may also result in the development of personality disorders, especially those involving affective, explosive, and hysterical behaviors.

The very nature of destructive behaviors, coupled with isolation from others, can seriously limit educational opportunities. When a caregiver's total activities must be directed toward managing destructive behavior, there may be no time available for the intervention and programming necessary to produce adaptive and recreational behaviors. The requirement to provide those with destructive behaviors the least restrictive educational environments possible may involve considerable time and expense. This in turn may adversely affect the total system of education for the larger group of persons with developmental disabilities.

The referral for special care or institutionalization is caused more by the occurrence of destructive behaviors among persons with developmental disabilities than by the individual's level of impairment. The additional staff required to work effectively with destructive behaviors greatly increases the cost to society. Persons with severe SIB may require care costing $100,000 or more per year. The legal and ethical requirements for reasonable care and safe conditions; freedom from bodily restraints; and adequate nutrition, medical care, housing, training, or habilitation apply to all persons with developmental disabilities, with and without destructive behaviors. This means that at a minimum states must provide each individual the benefit of an intervention program and freedom from undue restraint. The economic costs of these provisions for individuals with destructive behaviors cannot be determined precisely, but these outlays certainly add several billion dollars per year to total public expenditures for persons with developmental disabilities.

In addition, there are a number of indirect costs associated with destructive behaviors. These include the costs of not being able to participate in supported or competitive employment, which results in the need for income maintenance or other subsidies. Also included are the costs to families trying to maintain at home a family member with destructive behavior. The latter includes significant lost economic opportunities by precluding the employment of family members who must stay at home to care for and to protect their relative with destructive behavior.

What Are the Approaches to Prevent, Treat, and Manage These Behaviors?

Several approaches have been utilized in the prevention, treatment, and management of destructive behaviors in persons with developmental disabilities. On the basis of their formal features these approaches can be categorized as behavioral, educational, ecological, and pharmacological.

Behavioral Methods

On the basis of their performance effects, behavioral approaches can be subdivided into two general categories. *Behavior reduction approaches* are designed to reduce the incidence of a particular destructive behavior by providing an environmental change contingent on the occurrence of the behavior. In all cases a procedure or consequence is applied immediately following the display of the target behavior. *Behavior enhancement approaches* are designed to reduce the incidence of destructive behavior by making socially desirable responses more probable, that is, by reinforcing more appropriate competing or alternative behaviors rather than by suppressing the destructive behaviors directly.

In the contemporary application of behavior reduction treatments, several different procedural consequences are utilized, including brief (fraction of a second) faradic shock delivered to the skin; a disagreeable tasting substance placed in the subject's mouth; mouthwashing; oral hygiene; air, water mist, or ammonia salts placed briefly under a person's nose; or tickling.

Other behavior reduction procedures involve:

1. Overcorrection, in which the environmental effects of the undesirable behavior are corrected and desirable behaviors are thoroughly rehearsed or practiced (eg, cleaning up their own clutter and the clutter made by others).
2. Contingent restraint and protective intervention (restrictive jackets, helmets, etc.).
3. Facial screening (temporarily blocking the field of vision).
4. Time out (a condition in which positive reinforcement cannot be obtained).
5. Response cost (loss of tokens, points, or their equivalents).
6. Verbal reprimand.
7. Extinction (removal of the reinforcement that is maintaining the destructive behavior).

Behavioral enhancement approaches include two broad classes of intervention: differential reinforcement of other behavior (DRO) and differential reinforcement of incompatible behavior (DRI).

When DRO is applied one is rewarded for *not* engaging in the undesirable behavior. The procedure works in the following manner: First, a target behavior is identified and an appropriate positive reinforcer is selected. Next, a brief time interval is specified. The individual receives the positive reinforcement for anything he or she is doing after this interval has elapsed, provided that there is no display of the target destructive behavior during that time. As reinforced responses become more frequent over successive DRO intervals, they compete with and eventually replace the undesirable behavior with something better. In practice, an alternative behavior is chosen that is physically incompatible with the problem behavior; increasing the frequency of this incompatible behavior will necessarily produce a decrease in the undesirable behavior. An intermittent schedule of reinforcement is selected. If at the end of each time interval the individual is engaging in the incompatible behavior, the individual receives reinforcement.

Educational/Skills Acquisition Approaches

In the educational or skills acquisition approaches to treatment, the responses that are reinforced are those believed to enhance the individual's ability to perform competently in the daily environment. Here the emphasis is on teaching new behaviors that are likely to increase an individual's social competence.

Among the skills acquisition training approaches are:

- Compliance training (to respond correctly to a variety of verbal or nonverbal commands).
- Self-management training (self-monitoring, self-evaluation, and self-reinforcement).
- Communication skills training. Some destructive behaviors can be viewed as nonverbal forms of communication; hence, if new forms of requesting (eg, signing) are taught, these will replace the destructive behavior and enhance the social interactions of the individual.
- Functional independence training. Training in a variety of socially useful behaviors, including leisure skills, vocational skills, and self-help skills, corrects deficits presumed to trigger destructive behavior.

An essential step in the use of educational/skills acquisition approaches involves a functional analysis of existing behavioral patterns. The acquisition of compliance, self-management, communication, and greater independence (eg, leisure or self-help skills) represents a genuine educational gain for the individual; indeed, this may have greater long-term significance than the mere elimination of destructive behaviors.

Ecological Approaches and Stimulus-Based Treatments

In the course of everyday living, numerous events may transpire that alter the stimulus set for a given individual (eg, residential and/or staffing changes). Striking behavioral changes may follow (eg, SIB may flare up or, alternatively, may subside for longer or shorter intervals). This should be distinguished from the changes that are introduced as a result of a careful functional analysis of behavior; under such circumstances specific changes in setting events and ecological milieu are prescribed and put into effect to achieve prestated goals. This literature concerning ecological approaches to the treatment of destructive behaviors in persons with developmental disabilities is relatively new.

Stimulus-based treatment approaches described in the literature take various forms. Situations and settings that are correlated with low rates of problem behaviors can be scheduled more frequently into the individual's day. Stimuli that most often evoke destructive behaviors can be modified to reduce the triggering of the problem behavior.

Pharmacological Methods

The psychopharmacologic agents used to reduce destructive behavior, directly or indirectly, include neuroleptics (eg, chlorpromazine, thioridazine, haloperidol), sedative-hypnotics (barbiturates), stimulants (d-amphetamine, methylphenidate), antianxiety drugs (benzodiazepines), antidepressants and mood stabilizers (imipramine, lithium), anticonvulsants (carbamazepine, phenytoin, phenobarbital), antihypertensives (beta-adrenergic blocking agents such as propranolol and pindolol), and opiate antagonists (naloxone, naltrexone). The drugs most frequently prescribed specifically for destructive behavior are the neuroleptics, with thioridazine the most popular.

The prevalence of drug treatment for persons with developmental disabilities is disturbingly high. Average rates of psychotrophic drug use, primarily neuroleptic drugs, range from about 30% to 50% in both nursing homes and state-operated mental retardation institutions, and from about 26% to 36% in community-based residential facilities. These are usually point prevalence figures (measured at a single point in time); the lifetime prevalence rate (percentage of individuals receiving these drugs at some time during their lives) is much higher. Destructive behaviors figure prominently in prompting treatment with psychotropics. The most prominent symptoms evoking such treatment for persons with mental retardation in residential facilities are aggressiveness, hyperactivity, self-injury, excitability, and screaming.

3. What is the Evidence That These Approaches, Alone, or in Combination, Eliminate or Reduce Destructive Behaviors?

The following discussion of treatment efficacy is based on peer-reviewed, published research that reported empirical data derived from the application of controlled experimental designs. An evaluation of that evidence is complicated by a number of considerations. Research studies vary in terms of sample size and population (eg, level of functioning of subjects), the setting in which the study was conducted (eg, institution, school), the nature of the reported inquiry (eg, single subject or group experimental design), the rapidity and durability of the reported outcomes, and the timeframe within which the studies were carried out.

A considerable portion of the research literature on treatment approaches involves multiple interventions that do not experimentally isolate the contribution of each of the several interventions applied. To provide a firm scientific basis for our report, we focused on those studies in which it was possible to discern the direct effects of single treatment modalities, but the entire research literature was carefully reviewed.

Behavioral, Educational, and Ecological Approaches

Efficacy of Treatment

The majority of the studies of behavior reduction approaches were conducted from the 1960s to the early 1980s and report findings for treatments used primarily with individuals with severe and profound levels of mental retardation in institutional settings. To reduce the likelihood of the behavior recurring, various researchers employed a range of stimuli that were delivered contingent on occurrence of the targeted destructive behaviors. The number of studies available is relatively small, but enough data are forthcoming to provide a basis for reasonably firm conclusions. Using a criterion of 90% reduction of the target behavior from baseline measures, the behavior reduction interventions appeared to be effective in some individuals in suppressing destructive behaviors, particularly SIB.

Behavior enhancement approaches were applied in a variety of settings with subjects whose ages and levels of developmental disability ranged widely, including individuals with severe and profound levels of mental retardation in institutional settings. There is a paucity of research on these approaches; however, using the same criterion of 90% reduction of target behavior from baseline levels, DRO and DRI appear to be effective in treating some individuals.

The literature on educational/skills acquisition and stimulus-based approaches is in its infancy. Few published studies were available for review, in part because these techniques are rarely applied as single treatments. The available data show promising results for persons with aggressive behaviors and SIB.

Rapidity of Effects

In a majority of the studies of behavioral reduction interventions, maximum ($\geq$ 90%) suppression effects were seen in one to 10 days. Rapidity of effect is not the primary goal of either behavior enhancement procedures or educational or ecological treatments. In these interventions the emphasis is on increasing the probability that socially desirable behaviors will occur and will eventually replace problem behaviors. This process involves the strengthening of alternative responses, which usually takes time and thus delays the effects of the treatment. Although the use of behavior enhancement and educational or ecological treatments, particularly those utilizing stimulus change, can produce their effects quickly, it is not speed of effect so much as long-term change that is the central issue.

Durability of Effects

For the most part, follow-up studies of subjects treated with behavior reduction approaches have revealed that the suppression effect can endure for months and, indeed, persist for up to two years after the intervention has been discontinued. The extent to which other environmental factors contribute to this durable change is unclear.

Although follow-up studies of behavior enhancement, educational/skills acquisition, and ecological approaches are rare, they do demonstrate maintenance effects of nine months or more, providing evidence of long-term gains.

Pharmacological Approaches

Neuroleptic drugs are widely employed in managing persons with develomental disabilities and destructive behaviors but are rarely prescribed with the specific therapeutic intent of treating a psychiatric condition. Instead, they are usually prescribed for individuals with developmental disabilities because they can suppress motor activity (which, in turn, will incidentally diminish aggressive behavior). There is some evidence that neuroleptics are beneficial in treating some persons with developmental disabilities displaying aggressive behavior; however, insofar as reported data bear on this issue, no solid conclusions can be drawn as to the usefulness of these neuroleptic drugs specifically for SIB. Surprisingly, no study of the most popular neuroleptic drug, thioridazine, has ever been published that explicitly measures self-injury and meets the minimum requirements for a satisfactory clinical trial. The situation is equally unsatisfactory for chlorpromazine and haloperidol. Particularly troubling is the amount of variability in response found among individuals studied with the various neuroleptic drugs.

The major neuroleptic drugs differ in the extent to which they produce untoward side effects. Such side effects include a mild parkinsonian syndrome, neuroleptic malignant syndrome, and, if treatment is prolonged, tardive dyskinesia. In therapeutic doses, haloperidol is more likely than thioridazine or chlorpromazine to produce extrapyramidal side effects (including tardive dyskinesia).

The *sedative-hypnotics* such as barbiturates and chloral hydrate were used many years ago to control violent behavior and were superseded by meprobamate and the benzodiazepines (chlordiazepoxide and diazepam). All are generally considered to be ineffective for SIB, sometimes actually worsening the behavior they were meant to ameliorate.

At best, the *psychostimulants* such as methylphenidate and d-amphetamine are of limited utility in persons with severe and profound mental retardation. *Tricyclic antidepressants* have largely replaced the monoamine oxidase inhibitors in the general treatment of depression. Their usefulness in the treatment of disruptive behavior in this population is not supported by the few clinical reports except in the presence of a clearly identified affective disorder. Theoretically, *serotonin reuptake inhibitors* such as fluoxitene may be useful in treating agitated behavior in patients with a complusion for sameness, as in autism. Clinical data are lacking for its utility with other persons with developmental disabilities.

Because of its beneficial effects in treating bipolar affective disorders in persons who are not developmentally disabled, *lithium carbonate* has been used to manage aggressive behavior in persons with developmental disabilities. A few studies with a small number of subjects suggest beneficial effects, particularly when depression and restlessness or tantrums and aggressive behavior are present. If an accurate diagnosis of endogenous depression or bipolar affective disorder can be made, the use of lithium is frequently efficacious.

Anticonvulsants, widely used in the treatment of seizure disorders, are reported to have favorable effects on behavior. Because these effects occur in persons with and without epilepsy, the clinical improvement does not appear to be due merely to better seizure control. In particular, carbamazepine has been shown to have psychotropic effects in addition to its anticonvulsant properties. Unfortunately, clinical trials are too sparse to warrant any general conclusions regarding its efficacy in controlling assaultive or self-injurious behavior.

Antihypertensives have been used in small numbers of subjects with varying results. Beta-adrenergic blocking agents such as propranolol and pindolol have been reported to reduce rage-related reactions under some circumstances, but no satisfactory clinical trials in persons with developmental disabilities have been reported.

Opiate antagonists show promise of being important for SIB treatment. Basic research in neurochemistry and neuropharmacology may have substantial influence on the development of drugs that specifically alter self-injurious behaviors. Much of the current work on possible biochemical mechanisms involved in SIB stems from attempts to understand the neurochemistry of Lesch-Nyhan disease, with particular emphasis on dopamine neurotransmission. Other recent developments concerning the neuropharmacology and behavioral pharmacology of endogenous opiate-like polypeptides (opioids) within the brain have provoked great interest in another hypothesis that may further the understanding of the origin and maintenance of SIB. Within this framework, such behavior can be characterized as "addictive," that is,it may be maintained by pain-elicited release of endogenous opioids. This theory remains attractive but unproven; clinical studies of opiate antagonists such as naloxone and naltrexone, which block the effects of endogenous opiates, have yielded conflicting results.

4. What are the Risks and Benefits Associated with the Use of These Approaches for the Individual, Family, and Community?

The terms "benefits" and "risks" cover more than the elimination or exacerbation of the targeted behavior in persons with destructive behavior. Risks in this context refer to the probability and magnitude of harm; benefits refer to the probability and extent of gain in well-being. Risks and benefits affect individuals, families, and communities and thus can be assessed across multiple domains (eg, physical, psychological, and developmental changes in the individual; family stress; social, economic, and legal impacts for the community). Durability and generalizability of response are both necessary considerations in the assessment of risks and benefits. In the course of assessing benefits and risks, the effectiveness of treatments in facilitating other educational, behavioral, and social interventions must also be considered.

The scientific literature is generally silent on most issues of risks and benefits with respect to specific behavioral interventions for persons with developmental disabilities with destructive behaviors. The literature on pharmacologic agents is restricted to efficacy and toxic effects on the individual receiving the medication. The literature on behavioral interventions is restricted primarily to suppression of target behavior and to durability and generalizability of effect. Limited empirical literature was found on the familial and/or societal impacts of the use of either pharmacologic or behavioral interventions for persons with developmental disabilities exhibiting destructive behaviors. However, there has been considerable public debate and scrutiny by a variety of advocacy organizations, professional associations, and governmental bodies of the risks and benefits of the various treatment approaches for destructive behavior among persons with developmental disabilities. The focus of the debate and scrutiny has been primarily on moral, social, and legal implications of the use of specific interventions.

In treating persons with developmental disabilities who exhibit serious destructive behavior, the determination of risks and benefits is far more complex than in most disorders. Strict criteria for benefit can be readily established in the experimental setting; however, there is no single, easily measured endpoint in the clinical setting. Greater freedom from self-injury or greater safety for others is not sufficient, if these results are obtained at the expense of the individual's ability to function as optimally as possible within home, work, or school settings. The probability and degree of loss or gain of the individual's capacity to be independent, to learn, to work, or to play must be considered in the risk/benefit analysis. Traditionally risks or benefits have been defined solely in terms of the effect of the intervention on the targeted behavior. We concur with the following array of outcome measures: (1) protection of health and safety, (2) reduction of destructive behaviors, (3) increase in adaptive behaviors, and (4) development of appropriate levels of physical integration, social integration, and variety in activity patterns.

Rigorous scientific validation of the benefits of pharmacologic intervention among persons with developmental disabilities with destructive behaviors is extremely limited. The problems in the evaluation of the benefit of drugs for the control of destructive behavior arise from a multiplicity of factors, including (1) problems in accurate diagnosis (because destructive behavior may occur in a wide variety of disorders); (2) problems resulting from the large number of variables (eg, differences in participants, drug design, environmental factors, and measurement); (3) problems in identifying social consequences of treatment (eg, altered learning ability); and (4) problems of small sample size. Ethical and operational problems arise in double-blind design and placebo use; all too often side effects such as somnolence may identify recipients of active medication in contrast to recipients of placebos—and the double-blind element in the study is nullified.

In addition, the risk of harm from medication is also difficult to assess because there are few controlled protocols, including detailed laboratory studies. Harmful effects may be delayed for months and even years. The drug itself may mask its own harmful side effects, for example, tardive dyskinesia associated with neuroleptic drugs. Undesirable behavior may be reduced, but at the expense of diminished learning and delayed development. Despite all of these limitations, a body of somewhat reliable evidence does exist in the literature. Common to all of these reports is the inevitable problem that the available evidence may be skewed. In the nature of things, positive (beneficial) effects are more likely to be submitted and accepted for publication than inconclusive results. Likewise, toxic manifestations are more likely to be reported than evidence of no harmful side effects. Therefore, conclusions from the literature must be regarded with some degree of caution.

A beneficiary of psychotropic drug treatment may be family members or other caretakers, whose task may be reduced substantially if serious destructive behavior is reduced or eliminated (even if accomplished principally through sedation). In some instances, drug treatment may be resisted by families because it is seen as addictive, debilitating, and having serious side effects. Families require counseling in regard to appropriate use and side effects of drug treatment. It is essential that decisions regarding drug treatment be made for the benefit of persons with developmental disabilities and not for the convenience of the caretaker. On the other hand, when they are genuinely effective, psychotropic drugs may ease the burdens of care, make family life less stressful, and improve the social image of persons with disabilities in their communities.

Liability for administration of drugs by nonmedical personnel is a major service delivery problem in the community. In agency settings, inadequate supervision by physicians who may rarely see the individual patient is a significant problem. These physicians may be generally unfamiliar with the needs of persons with developmental disabilities. One risk stems from the community and professional belief that drug therapy can substitute for appropriate individualized programming aimed at the elimination of undesirable behavior and at the development of improved social functioning.

Research on behavioral, educational, and ecological interventions provides evidence for the effectiveness of these approaches on the suppression of destructive behavior and durability of response. Few studies, however, systematically examine collateral effects on the individual, family, or community. Anecdotally, investigators often report positive side effects following the suppression of the destructive behavior (eg, increased school and community participation, enhanced family relationships); indeed, such positive collateral effects are reported significantly more often than negative side effects.

Negative side effects of behavioral interventions also have been reported anecdotally for both behavior enhancement and behavior reduction approaches. For example, some interventions have been found to lead to the emergence of other forms of self-injury or other forms of undesirable behavior. In addition, relapse following discontinuation of treatment may lead to more severe or more intractable forms of destructive behavior. Additional side effects that have been reported include decreased social behavior, increased aggression, and increased stereotypes. Less visible side effects associated with behavior reduction approaches include the potential for abuse in the application of these procedures, the psychological effects on staff, and, most important, the negative and demeaning social image that the use of some of these procedures conveys to the general public about persons with developmental disabilities.

A major controversy has erupted in the last decade regarding the use of behavior reduction approaches (also called aversive treatments). The controversy includes both the credibility of the scientific evidence regarding the effectiveness of such techniques and the ethical aspects, legal issues, and social acceptability of these procedures. A bitter and acrimonious debate has developed among families, advocates, professionals, organizations, and government agencies. Additional research is urgently needed on the risks and benefits of the use of various behavioral as well as psychopharmacologic interventions for persons with developmental disabilities with destructive behaviors.

5. Based on the Answers to the Above Questions and taking into Account the Behavior; the Diagnosis and Functional Level of the Individual; Possible Effects on the Individual, Family, and Community; the Treatment Setting; and Other Factors, What Recommendations can be Made at Present Regarding the Use of the Different Approaches?

The panel believes that although single treatment modalities are demonstrably effective, the most successful approaches are likely to involve multiple elements of therapy, environment, and education. Depending on the severity of the destructive behavior, therapy may require methods for enhancing desired behaviors; for producing changes in the social, physical, and educational environments in which the individual lives; and for reducing or eliminating destructive behaviors. Regardless of therapeutic approach chosen, informed consent must be obtained.

Treatment should be based on an analysis of the biological and environmental conditions that may maintain an individual's destructive behaviors. The results of this analysis should guide the design of the treatment intervention. Such an analysis should include identification of medical and psychiatric conditions that may contribute to the problem, environmental situations that may evoke the destructive behavior, and the consequences and skill deficits that may be maintaining the destructive behaviors.

Behavior reduction procedures should be selected for their rapid effectiveness *only* if the exigencies of the clinical situation require short-term use of such restrictive interventions and *only* after appropriate review and informed consent are obtained. It is recognized, however, that behavior reduction procedures make little or no direct contribution to providing constructive alternatives to the destructive behaviors targeted for elimination. Thus, the interventions should be used *only* if they are incorporated in the context of a comprehensive and individualized behavior enhancement treatment package.

Psychopharmacologic agents should be used as a specific treatment for individuals with developmental disabilities who have identified psychiatric syndromes. In crisis situations, medications may also be prescribed for the symptomatic relief of agitation or for temporary control of dangerous behavior. The short-term use of behaviorally active drugs may be justified to gain a window of opportunity for the introduction of more specific behavioral and educational treatments; as a rule, this does not require prolonged administration of these agents. These agents should never be administered for extended periods as the only way of controlling disturbed behavior of unknown etiology. The selection and continued use of pharmacological agents should be based on objective evidence of beneficial behavioral change and acceptable levels of undesired side effects.

The goal of all treatment approaches should be to maximize the potential and adaptive abilities of all persons with developmental disabilities with destructive behaviors so that they can live in as culturally normal an environment as possible under conditions of physical and psychological well-being. The primary objective of treatment must be the development and implementation of individualized comprehensive behavior enhancement strategies that protect the individual's health and safety and promote the opportunity to develop appropriate social and cognitive skills.

6. What Research is Needed on Approaches for Preventing, Treating, and Managing Destructive Behaviors in Persons with Developmental Disabilities?

The consensus development panel examined current knowledge about the extent and nature of destructive behaviors in persons with developmental disabilities. Treatment approaches and their effectiveness were reviewed. Although information in this area is increasing, serious and extensive gaps exist in our knowledge base. New resources must be allocated for research on all treatment modalities. Specifically, the panel recommends research on behavior enhancement procedures and educational (skills acquisition) and ecological approaches. Basic research is also needed on behavior and on the brain and its development in relation to the causes of destructive behaviors. The cooperation of investigators from many relevant disciplines and the rigorous application of appropriate research principles are required.

The panel also recommends the following topics for future research.

Taxonomic and Epidemiological Studies

- Development of a taxonomy of destructive behaviors for research and diagnostic purposes.
- Studies of the incidence and prevalence of destructive behaviors and of the frequency and characteristics of the various treatment modalities used in institutions, schools, community settings, and homes. Such studies should enumerate findings on a state-by-state and a national basis.
- Studies of the impact of destructive behaviors on families and communities.
- Studies of the mortality and morbidity of various forms of SIB.
- Investigations into the relationship between psychiatric diagnosis and destructive behaviors in persons with developmental disabilities.

Basic Research

- Clinical and experimental studies of the origins, natural history, and ecology of individuals at risk for destructive behaviors.
- Studies of the biological bases of destructive behaviors that incorporate applications of the latest technologies in neuroimaging, electrophysiology, and neurochemistry.

Treatment

- Multicenter interdisciplinary studies using common measures and comparing alternative treatments and their components with regard to the degree, rapidity, and durability of desired effects.
- Research on the effectiveness of all treatment modalities.
- Research on clinical outcome measures, including the development of appropriate instruments reflecting the degree to which individuals are socially integrated into home, school, employment, and community life.
- Research on the development of more effective pharmacologic agents.

Conclusions and Recommendations

- Destructive behavior among persons with developmental disabilities presents a unique therapeutic and human challenge. The estimated cost of treatment of these persons exceeds $3 billion annually.
- All forms of destructive behavior have serious consequences for people with developmental disabilities and for their families, which can seriously limit their life opportunities.
- Most successful approaches to treatment are likely to involve multiple elements of therapy (behavioral and psychopharmacologic), environmental change, and education. Treatment methods may require techniques for enhancing desired behaviors; for producing changes in the social, physical, and educational environments; and for reducing or eliminating destructive behaviors.
- Treatments should be based on an analysis of medical and psychiatric conditions, environmental situations, consequences, and skill deficits. In the application of any of these treatments, an essential step involves a functional analysis of existing behavioral patterns.
- The prevalence of drug treatment in persons with developmental disabilities is disturbingly high and lacks robust scientific validation. The use of pharmacologic agents should be restricted to persons with identified psychiatric syndromes or be designed to facilitate the establishment of behavioral, interpersonal, or educational therapies.
- Behavior reduction procedures should be selected for their rapid effectiveness *only* if the exigencies of the clinical situation require such restrictive interventions and *only* after appropriate review. These interventions should *only* be used in the context of a comprehensive and individualized behavior enhancement treatment package.
- New resources must be allocated for future research on all treatment modalities, particularly behavior enhancement procedures and educational (skills acquisition) and ecological approaches.
- Newer pharmacologic approaches merit intensive investigation. Through basic and clinical research, the potential exists to develop drugs that could operate directly and specifically on eliminating self-injurious behavior.
- Research is needed on the origins, natural history, and ecology of destructive behaviors among persons with developmental disabilities.

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Magda Campbell, MD: "Aggressiveness Directed Against Self and Others: Pharmaceutical Treatments"

Judith E. Favell, PhD: "Environmental Foundations of Destructive Behavior"

Richard M. Foxx, PhD: "Decreasing Severe Behaviors With Punishment Procedures: Discontinuing Their Use While Maintaining Long-Term Treatment Effects"

Barbara H. Herman, PhD: "Use of Opiate Antagonists in the Treatment and Biochemical Evaluation of Individuals With Self-Injurious Behaviors"

Robert H. Horner, PhD: "Recommendations Based on Community Support for People With Developmental Disabilities and Destructive Behavior"

Brian A. Iwata, PhD: "A Behavorial Prescription for the Prevention and Treatment of Severe Behavior Disorders"

Gary W. LaVigna, PhD: "A Model for Multielement Treatment Planning and Outcome Measurement"

Thomas R. Linscheid, PhD: "A Model for Multielement Treatment Planning and Outcome Measurements"

Thomas R. Linscheid, PhD: "Clinical Evaluation of the Self-Injurious Behavior Inhibiting System"

William L. Nyhan, MD, PhD: "Biological Eitiology of Destructive Behaviors"

Raymond G. Romanczyk, PhD: "A Review of the Literature on Self-Injurious Behavior: Factors That Should Influence Clinical Decisionmaking"

Murray Sidman, PhD: "A Behavior Analyst's View of Coercion"

Robert L. Sprague, PhD: "The Need for Integration of Pharmacological, Behavioral, and Positive Reinforcement Treatments"

Paul E. Touchette, EdD: "Humane, Permanent Elimination of Destructive Behavior Via Analysis and Manipulation of Stimulus Control"

David P. Wacker, PhD: "Further Evaluation of Functional Communication Training: An Analysis of Active Treatment Components"

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Building Cathedrals: One Physician's Perspective

MICHAEL T. KOVALCHIK, MD

I awoke suddenly, unsure why, as I glanced through the penetrating darkness at the blinking readout of the alarm clock. 3:55 A.M. Suddenly the phone and I realized why I was awake. "Yes, hello, Mr. Jenkins, cardiac arrest, I'll be right there." I stumbled to the bathroom with the legs of a drunk attempting to walk a straight line. A quick splash of the face, a comb through the hair, a fast change of clothes, and I was out the door. However, I was quite pleased when I remembered to call the answering service to inform them of my return to the hospital so my wife would not be plagued by the incessant telephone.

On the way to the hospital, I observed a beautiful moonlit night with fresh soft snow, untouched and velvet. The quiet was so intense I could feel it. I recalled Mr. Jenkins, an associate's patient, whom I had cared for on several prior occasions. A simple but honest man whose heart was ravaged by virtually totally occluded coronary arteries. He was a farmer who lived off and loved the land. He was surrounded by a caring and devoted family. His children all lived on land he provided near his farm. They had supported him in the last two years while everyone predicted he would not survive. Home oxygen, intramuscular morphine, and love.

As I walked into his ICU room, he was surrounded by a swarm of white uniforms, counting, measuring, documenting the progress of the resuscitation. The focus was on recording, skillfully avoiding the drama of a life hanging by a thread, dependent on the events at hand. I paused, and everyone stopped and waited for me to take charge. I waited, observed his face, and knew the situation was hopeless. Codes, once started, tend to develop their own momentum no matter how impractical, hopeless, or simply futile they may seem. We tried everything and I performed my duties almost ritualistically. After nearly one hour, I, like the maestro, pronounced that we had completed our symphony and proclaimed the mechanical last rites to be complete. Everyone sighed and quickly left the room, leaving me alone with Mr. Jenkins. I could hear small talk among the staff through the closed curtain as I paused to observe him. His body was all that was left of this extremely vital man. Why was it that his family loved him so? I could imagine him as an infant, a child, a young man stealing his first kiss from his future wife. I could picture his enthusiasm as a new father, holding his fragile baby son with his rough calloused hands. He was gone. What happens to all his experiences, enthusiasm, and the meaning he worked so hard to touch?

I slowly walked out of the ICU, making my way to the waiting room. The family was there, crowded together, anxiously awaiting my entrance. Did they know he had perished? The look on their faces mirrored hope, anxiety, and tension, so intense it was physically apparent. I sat down, an empty chair was waiting, sighed, and announced he was gone. The scene that followed was one I had witnessed so many times before. Physical anguish, verbal sorrow and loss, all converged. The intensity was incredible. The room shrank upon me, the temperature rose while I waited. Time seemed to stand still. I had learned to wait. Nothing can contain these emotions. To interject at this juncture, to attempt to negate the grief as I have so often observed only masks the physician's sense of frustration, anxiety, and inability to touch his own feelings. I remember Shakespeare (Macbeth Act IV):

> "Give sorrow words: the grief that does not whispers the o'er-fraught heart, and bids it break."

After what seemed like countless minutes, there was a pause and I finally spoke. I explained the circumstances surrounding his death and concluded that in the end he did not suffer. I looked at all their eyes. Each pair spoke to me with incredible emotion. Each set was colored differently by their own unique experience. An expectant mother, a new father, a brother. Was he next? Had Mr. Jenkins rocked his now pregnant daughter to sleep in an old wooden cradle when she was a tiny infant?

I left the family with their grief. They were soon to live their own personal soap opera. I had to put it behind me, but I knew it was not possible. To deny these feelings was impossible for me. I just had to tuck them into a corner with the rest of my experiences.

Morning! I felt the loss of my daily shower as I made my rounds in ICU. I sipped my coffee as I reviewed the charts of my three remaining patients. I started my rounds. Mr. Giovanni, a wonderful man, kind, gentle, was slowly drowning in his pulmonary edema. He had a severe cardiomyopathy coupled with renal failure requir-

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ing dialysis. However, dialysis could not keep up with the failing heart. Fluid kept coming back. He suffered so in his breathlessness. He smiled as I entered, a smile that exuded compassion and kindness. He asked little. Finally I asked if there was anything I could do for him. He said no, again with a smile. I left, sensing his pain and suffering, but mostly uplifted by his courage. Could he pull through?

I drifted over to Mr. Pont, a mentally retarded man, on a ventilator due to an unknown pulmonary process with early kidney failure and severe ischemic heart disease. He had been in the ICU for weeks. His prognosis was hopeless. Unfortunately, he was a ward of the state. His distant family, while caring for him, felt powerless in making those decisions at the end of life. Who was responsible? Could we make him a DNR? Could we withdraw the ventilator? Physicians, family, and administration, where did we fit? Who would take the responsibility? Finally, out of frustration, I wrote DNR. As a physician, I deemed the situation hopeless, I felt no obligation to prescribe the therapy I felt ineffective. Would the state challenge me or threaten the hospital accreditation if we did not attempt resuscitation? To me, this was a final episode of a long chapter. I had experienced this similar situation too many times and felt powerless. It was time to recognize my value system and act accordingly.

I slowly walked to the third patient, Mrs. Godburn, brought to the emergency room from the nursing home. The family had carefully thought out their desire to avoid heroic life-saving measures in this 86-year-old woman who had suffered several strokes, was totally bedridden, and did not recognize her family while requiring feeding through a gastric tube. A "no code" was dutifully written on her chart in the nursing home. When she stopped breathing, the nurse, her first day on the job, called the paramedics without consulting the chart. When they arrived, they were informed of the "no code" status. However, they proceeded to perform CPR. "State policy," they could not still their own momentum once called regardless of the patient's or family's wishes. So there she was on the ventilator with a very angry family at her side. I was left to attempt to pull the pieces together. I had no energy left. I recalled the origin of the term "scapegoat" and understood that the family had just given me all their guilt and anger. I took it with me as I left the room.

It was late and I was moving slowly. Nine more hospital patients to see before the afternoon patients started. Two of these patients were awaiting lengthy discharge instructions. I made a quick inventory of my options. I cancelled my noon administrative meeting and cut a few corners making rounds. I often toyed with the fantasy of not answering my incessant pages. I could not put off any office patients as there was no way to reschedule them in the next few weeks. More importantly, I always felt uncomfortable cancelling patients' appointments. It only prolonged their anxiety and intensified my work load.

I proceeded with my rounds and discharges. I thought of my children who again found their father gone when they awoke. My wife, in some ways, a married single parent coping with the uncertainty of my schedule and the threat of the telephone.

I recalled that my first scheduled patient in the afternoon was to be a young woman with a strong family history of polycystic kidney disease. She had elected not to undergo screening over the years. She had observed her mother's experience with dialysis and transplantation. Every complication possible had occurred and her mother died a very undignified death. I knew this had to weigh heavily on her mind as she waited to see me. She was soon to become a bride and as a consequence requested screening. Unknown to her, the ultrasound performed one week earlier was positive.

The fatigue, frustration, time urgency, and bureaucratic roadblocks weighed heavily on me. I had to collect myself as I moved from patient to patient. My patients were unaware of my day's experience. I had to let go of all the day's conditioning in order to connect with them. If I brought with me all the baggage from the early morning, I would be of no use to them. If I was to find a common language between myself and the patient, I had to be open and disconnected from everything except what was happening with that particular patient.

I left the hospital and made my way to the office. I recalled the old story of a man who visited a quarry, observing many men all doing the same thing, dressing stones. He approached one and asked him what he was doing. The stone cutter replied, "Making a living." He then approached another worker and asked the same question. This time the response was, " I am cutting stones." The third worker was approached and replied, "I am building a cathedral." All these men were doing exactly the same thing, yet each viewed what they were doing differently. The first viewed himself only in terms of his immediate desire, the second in terms of the technical challenge, whereas the last man incorporated the needs of the other workers but went beyond. So, when physicians, regardless of their accomplishments, view their work simply as fulfilling their immediate desire or as a technical challenge, they will only be making a living. I knew as I walked into my consulting room I was about to participate in an experience that was likely to be unique and long-remembered by the patient. How I conducted myself would influence to a great extent how the young woman would cope with the newly acquired diagnosis. As I walked in, she was standing reading a quote from Longcope on my consulting room wall.

> Pope has said that the "proper study of mankind is man" and even though a clinician has science, art, and craftsmanship, unless he is intensely interested in human beings, he is not likely to be a good doctor.

We shook hands and I closed the door. All of the fatigue, the events of the day, the cachophony of pages faded behind me. The unique bond of a physician/patient relationship energized me. I, newly vitalized, attempted to transcend my rudimentary obligations and focus on the unique magnitude of the task ahead.

Adolescents and Their Music

Insights into the Health of Adolescents

ELIZABETH F. BROWN, M.D. AND WILLIAM R. HENDEE, Ph.D.

During adolescence, teenagers are expected to develop standards of behavior and reconcile them with their perceptions of adult standards. In this context, music, a powerful medium in the lives of adolescents, offers conflicting values. The explicit sexual and violent lyrics of some forms of music often clash with the themes of abstinence and rational behavior promoted by adult society. Identification with rock music, particularly those styles that are rejected by adults, functions to separate adolescents from adult society. Some forms of rock music extend well beyond respectability in fulfilling this definitional role. Total immersion into a rock subculture, such as heavy metal, may be both a portrait of adolescent alienation and an unflattering reflection of an adolescent's perception of the moral and ethical duplicity of adult society. Physicians should be aware of the role of music in the lives of adolescents and use music preferences as clues to the emotional and mental health of adolescents.

TRADITIONALLY the role of physicians has been to conquer disease and promote health. For physicians who treat adolescents, this role has become increasingly challenging. Often an adolescent presents with a seemingly trivial physical complaint that, after questioning by the physician, expands into a set of complex problems related to the teenager's psychosocial environment. Frequently the tragic health problems of teenagers, such as unplanned teen pregnancies, accidents, and violence, have strong roots in the psychosocial environment. Prevention and intervention in these health problems require the physician to be more sensitive and knowledgeable about the environment of adolescents.[1]

Health promotion and disease prevention in the adolescent encompass multiple dimensions of health care. They go beyond the traditional advocacy of a healthy diet, exercise, and avoidance of health risks such as tobacco, drugs and excess alcohol to an understanding of the sociocultural forces that influence adolescents as they experience the transition into adulthood. Appreciation of this environment not only yields insights into the challenges facing adolescents but also enables the physician to identify adverse psychosocial problems and intervene before their consequences are expressed as health problems. One aspect of the adolescent environment that has been a source of concern since its appearance in the 1950s has been the role of rock music, specifically its lyrics. This concern has been enhanced by the visual imagery of rock music videos.

The term *rock music* is frequently used generically to encompass any type of music listened to by teenagers. However, the music associated with adolescents has, over the years, splintered into a wide variety of styles, including punk, heavy metal, rap, hip-hop, and house music, to name a few. The latter three styles are particularly identified with black adolescents. In this article, we have chosen to define rock music more narrowly, as music that might also be referred to as popular music and is typically played on the top-40 radio stations. This type of rock music is most often listened to by white adolescents. Much of the communications research has focused on this type of rock music and consequently on its effect on white adolescents. This article reviews and analyzes the recent communications literature on the impact of rock music on the lives of adolescents.

The Role of Rock Music

Music long has been recognized as a powerful communicative force that affects attitude, mood, emotions, and behavior. Anthropologist A. P. Merriam in his book *The Anthropology of Music* says, "The importance of music, as judged by the sheer ubiquity of its presence is enormous...there is probably no other human cultural activity which is so all pervasive and which reaches into, shapes and often controls so much of human behavior."[2]

For today's adolescents, music is particularly ubiqui-

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tous. During the early years of rock music, radios were heavy, bulky, and essentially stationary. Music became portable with the advent of transistor radios. Recent innovations in miniaturization and the development of light high-quality headphones have made it possible for teenagers to envelop themselves constantly in rock music. Between the seventh and 12th grades, the average teenager listens to 10 500 hours of rock music, just slightly less than the entire number of hours spent in the classroom from kindergarten through high school.[3] During this period, television viewing decreases and music becomes an increasingly powerful medium in an adolescent's life.[4]

Unlike television, for which the patterns of viewing are often subject to family discussion and parental control, music is largely uncensored. Parents frequently do not appreciate the sound of rock music and therefore ignore it. In the home, teenagers often listen to music in the privacy of their bedrooms,[5] and the ideas presented in the music are interpreted privately, without modulation or guidance by parents. Unlike television, music is controlled by the user; a song can be replayed anytime, anywhere, any number of times.

Music is important to adolescents in many ways. For example, music plays a large role in adolescent socialization. As adolescents gain independence, they turn to music as an information source about sexuality and alternative lifestyles, subjects that are largely taboo in both home and school.[6,7] Music can also introduce adolescents to political topics via the various concerts organized around political causes—for example, Amnesty International, Live Aid, or Farm Aid.

For young people, music is an important symbol in their search for independence and autonomy. Identification with a particular musical style may indicate resistance to authority, provide an outlet for personal troubles or conflicts with parents, or yield a sense of relaxation, release, and security in new environments. Music can be used to heighten emotions and encourage movement, such as dancing or clapping, or can be used to soothe emotions and provide relaxation. Music can be used alone, as background for other activities, or as the focus of events such as concerts.[8-10]

While rock music may generally symbolize adolescent rebellion and search for autonomy, the forms it takes differ among different cultures—the preference of black adolescents for rap or house music has already been mentioned—and also between sexes. For example, heavy metal music with its loud beat and performers with aggressive and startling stage antics attracts primarily white male adolescents. On the other hand, adolescent girls tend to be more attracted to soft, romantic, nonthreatening music. Weinstein[11] proposes that these musical preferences reflect the different types of struggles that boys and girls face as they make the transition to adulthood. As children, boys are typically allowed more freedom, to behave more aggressively, and to be slightly naughty. In contrast, as an adult, strict conformity and supervision is the rule. Heavy metal music then, though an extreme example and certainly not appealing to all boys, represents this conflict. A salient struggle for adolescent girls is the emergence of sexuality and the initiation, or at least contemplation, of sexual activity. Soft, romantic music serves to ease tensions about sexual activity in a nonthreatening way.[11]

Knowledge of rock music is used as a criterion of expertise by many adolescents, and music and musical personalities are often the subject of adolescent conversations. Shared enjoyment of music can be the basis of new friendships and form the basis of peer groups. Rock music has spawned many "cultural accessories" such as T-shirts, posters, and dress styles that are a prominent part of the adolescent's life.[6] Some youth subcultures such as punk rockers and heavy metal stylists can be immediately identified by music and sartorial preferences that imply a common bond with other devotees of the same musical genre.

In some cases, identifying features of adolescent preferences transmit a strong message of adolescent alienation. For example, Roe[10] proposes that there is a causal link between school performance and music preference. Specifically, academic performance defines status; negative status can lead to antischool activities, which then in turn result in alignment with an adolescent subculture. Therefore, students who perform well in school will be more likely to embrace the values taught in school, while those who perform poorly are more likely to react negatively toward the institution that labeled them failures. A heavy involvement in rock music by low achievers may be an adaptive reaction to their failures as students and an expression of their alienation from school and the learning experience. Affiliation with a particular teen subculture provides these youngsters with an identity and reputation that has been unattainable through academic performance.[10]

A longitudinal study of the academic performance and music preference of Swedish youths from age 11 to 15 years supports this hypothesis. Successful students, including those from low socioeconomic backgrounds, exhibited a preference for mainstream music, less interest in punk and rock music, and less involvement in peer groups. Lower school achievement was indirectly related to a preference for rock music through an intervening factor of greater involvement with peer groups. In addition, a negative commitment to school, identified on a questionnaire, was directly related to a preference for punk and rock music.[10]

Roe[10] states that "the findings unequivocally support the argument that music preferences are dependent on earlier levels of school achievement." This analysis challenges the widely held assumption that music, as a competitor for the time and commitment of young people, has a deleterious effect on school. It also suggests that teenage immersion into a rock subculture may be primarily symptomatic of alienation and hostility toward adult society.

Television is the entertainment medium for mainstream America, whereas rock music represents the adolescent peer culture. A study by Larson and Kubey[5] revealed that adolescents who preferred to watch television spent more time with their families and were reasonably well integrated into mainstream American culture. Similarly, heavy involvement with rock music is associated with a greater commitment to peer groups and less association with family.

Rock Music Lyrics and Videos

Against a backdrop of the pervasive presence of music, its multiple roles, and its power in communicating messages, the lyrics and images of rock music have been a persistent controversy. As a reflection of its origin in rhythm and blues, rock music espouses the themes of rebellion and sex. Even the words "rock 'n roll" have strong sexual connotations. Attempts at censorship have occurred since the inception of rock music. For example, the BBC banned the line "I'd love to turn you on" in the Beatles song, "A Day in the Life." To appear on the *Ed Sullivan Show* the Rolling Stones were required to change the lyrics and title of their song from "Let's spend the night together" to "Let's spend some time together" *(New Republic.* August 12, 1985;19:14-16).[12]

Such concerns seem quaint in light of explicitness of the lyrics of current rock music. Parents groups and other concerned citizens have characterized many rock lyrics as sexually explicit and violent. For example, the song "Darling Nikki" by rock star Prince (which sold 10 million copies) speaks crudely of masturbation, and other songs by this artist refer to fellatio and incest. Ozzy Osborne's "Suicide Solution" distinctly advocates suicide.

Heavy metal music, a musical style more rebellious than mainstream rock music, features a loud pulsating rhythm and abounds with lyrics that glorify hatred, abuse, sexual deviancy, and occasionally satanism. While rock and roll has always symbolized rebellion, it has only recently embraced outright hatred and rejection through the style of heavy metal.[13] In earlier music that preceded rock and roll, connotations were implicit, often using the word "it" as an euphemism for sexual experiences, such as in Cole Porter's "Birds do it, bees do it." Even the Beatles proposed, "Why don't we do it in the road?" In the 1980s the word "it" is no longer needed; the most deviant sexual activities can be described.[3]

Preteens and teenagers are highly impressionable and many have speculated that they may be particularly sensitive to the messages of rock music. In *The Closing of the American Mind,* Bloom[14] calls music the "medium of the human soul." He finds rock music barren and a "junk food for the human soul." Young teenagers with emerging concepts of sensuality and sexuality are not nurtured slowly and carefully by rock music; they are bombarded with messages about adult sexuality and perversities at an age when they have immature concepts of love, caring, and commitment. According to Bloom the pervasiveness of rock music undermines parental control over a child's moral education.

In 1985, there were well-publicized discussions about the sexual and violent content of lyrics, prompted in part by a citizens group, The Parents' Music Research Center, which culminated in hearings before the Senate Commerce Committee in September 1985. Much of the discussion and controversy centered on adults' perceptions of the meanings of rock music. However, several studies indicate that an adult's interpretation of rock lyrics might be entirely different from that of a teenager.[15] A complete understanding of rock lyrics that is consonant with an adult's interpretation of the lyrics often requires sophistication beyond the reach of young persons. The symbolic meaning of a song, represented more by the rhythm of the music and personalities of the artists, may transcend any explicit apprecation or interpretation of its lyrics and may be the primary attraction for adolescents. For example, few teenagers in a survey of Southern California high schools correctly identified sex, drugs, or violence as subjects of their favorite songs. In 37% of songs listed as their favorites, the students were unable to identify any theme. Sex, drugs or violence were identified in only 7% of the songs and even then the students' interpretations of the lyrics were frequently quite literal and unsophisticated; the teenagers very infrequently understood the symbolic meanings of the lyrics. The most prevalent items identified by the students were love and friendship and other themes that generally reflected experiences of teenage life.[15]

In a study of upper-middle-class 4th, 8th, and 12th grade and college students, Greenfield et al[16] found that a surprisingly few number of students correctly interpreted the general theme of Bruce Springsteen's song "Born in the U.S.A.," even though the song was familiar to most students and the students were questioned directly after listening to it. The "correct" interpretation of alienation vs the common "incorrect" interpretation of "Born in the U.S.A." as a patriotic song increased with the age of the students, but still barely 50% of the college students identified the "correct" theme.[16]

Even though adolescents' understanding of the lyrics might be unsophisticated, their individual appeal and symbolic importance cannot be discounted. These young persons may be responding more to the themes of independence and rebellion against parental authority symbolized by rock music than to its actual verbal messages, for music is more than lyrics, rhythm, and melody. It is an interaction of these attributes with the listener's personality and receptivity and includes a perception of attitudes and style manifested by the performer.[17]

The visual dimensions of rock music have also been an enduring concern from the era of Elvis Presley's swiveling hips to the frankly sexual or violent stage antics of today's performers such as Prince and Ozzy Osborne.

Music videos have added yet another visual dimension to rock music. Typically, rock vidoes have a surreal, dreamlike quality with dramatic visual effects.[18] There is concern that the marriage between television and music is powerful and synergistic. Multisensory input reinforces any message, specifically by enhancing learning and recall.[13] As an example, one study of music video found that individual meanings for a music video version of a song were more favorable and potent than the audio version alone.[19]

The violent and sexual content of the video images are disturbing to many. In one content analysis of 200 concept videos (distinguished from performance videos in which the predominant theme is a studio or concert performance), violence occurred in 57% of the samples and sexual intimacy in 75%. Of the videos containing violence, 81% also contained sexual references. Half of all women who appeared in the video were dressed provacatively.[20] Another study showed that 59.7% of a random sample of rock videos had sexual themes, and 53.2% had violent themes.[21] In an analysis of sexism in a sample of rock videos, 57% of those depicting women portrayed them in a condescending manner while only 14% depicted women as fully equal to men.[22]

Studies of the effects of television violence may also apply to music videos. These studies strongly suggest, but do not verify, that there is a causal connection between television violence and subsequent aggressive behavior.[23] Gerbner and coworkers[24,25] argue that television violence also may have a more subtle influence on social relationships. They hypothesize that the violent world of television portrays a pattern of domination, sexism, and inequality that colors viewers' perceptions of the real world. Those who view an excessive amount of television tend to regard the world as mean and hostile.

However, television and music videos may not be strictly comparable. For example, the negative imagery in the visuals of music videos may be mediated by their surrealistic and abstract qualities. Burns and Thompson[26] suggest that music videos may help young people to confront the real problems of adolescents growing up in our society. The frequent themes of holocaust and apocalypse presented in music videos, while irrational and dreamlike, may offer a subjective way of addressing these threatening problems in contrast to the depressing and sometimes complacent presentation by the news media of the threat of nuclear war.

Walker[27,28] argues that the total media profile of a viewer must be assessed before the influence of any one medium can be analyzed. High levels of violence on videos would be a significant concern, for example, only if they are associated with high levels of violence on the television programs watched by the viewer. However, Walker found that music video exposure is negatively related to watching televised crime and action programs.[27,28]

Some researchers have suggested that music videos, by supplying a visual image, inhibit the imagination. When a listener hears a song previously seen on a music video, the video image comes to mind instead of an individual and personally meaningful one. In this way music videos destroy the potential of music to evoke special feelings and memories for the viewer.[29] In an informal empirical study of the effect of music videos on the imagination of fifth and sixth graders, Greenfield and coworkers[16] found that those students who had watched a music video had less imaginative responses to a series of questions than those students who had only heard an audio version of the same song. The students themselves commented that seeing a music video before hearing the song on the radio inhibited their imaginative thinking about the song. In their studies of 587 high school students, however, Sun and Lull[30] found that although students enjoyed the visual images of music videos and used them in interpreting the music, they also were actively involved in selecting the music and had some perspective on music videos' content.

The Effects of Rock Music

The lyrics and images in rock music and rock music videos are certainly disturbing. However, there have been few studies of the effects of these new trends in music. Such a study is methodologically very difficult. Rock music audiences are not totally passive, uncritically absorbing the lyrics and images of rock music. That is, adolescents are active participants in the rock music experience and are not "victims" of rock music.[9] Rock music, or any music for that matter, is processed through several complex steps in each individual. The listener first chooses certain music to satisfy a specific need. Then the message of the music is interpreted by the individual and assimilated and applied to the listener's daily life. In this way interpretation and use of a particular message provided by music are intervening variables between the verbatim lyrics and any possible effects.

In addition both the choice of the music and the way in which it is used by its fans are heavily influenced by such variables as social class, age, education, race, religion, or gender. While both a 13-year-old girl and a blue-collar worker both might enjoy the music of Prince, for example, their interpretation of the music and the way it fits into their lives is probably very different. Music can also be but one component of an immersion into an adolescent subculture. For example, the subculture represented by punk and heavy metal music is intimately linked with distinct dress codes, language, and attitudes.[8] Quite simply, music can mean different things to different people at different times. Music is a very individual and complex experience and thus resistant to traditional research.

The effects of music and its lyrics on teenagers are subtle and cumulative and could only be definitively studied in a carefully controlled longitudinal study. This type of study is unrealistic. Therefore, it is also unrealistic to expect that any direct causal role of music on the behavior of teenagers can be easily identified.

The evidence of possible effects of explicit rock music, specifically heavy metal, has so far been anecdotal and circumstantial. Heavy metal music is of particular concern since it is such a strong expression of rebellion and sometimes alienation. For example, several murders have been correlated with a fascination for heavy metal music. The "Night Stalker," a serial murderer on the West Coast, was said to be obsessed with the heavy metal band AC/DC. A 14-year-old girl, also fascinated with heavy metal music, stabbed her mother to death (*US News World Rep.* October 28, 1985;46-49). In a study of chemically dependent adolescents, 60% named heavy metal as their first choice of music, leading the author to suggest that such music is associated with and may promote destructive behavior in susceptible individuals.[31] Healthy well-adjusted teenagers, on the other hand, may be minimally affected by explicit rock music.[32]

In a laboratory study of the effect of music television (MTV), Greeson and Williams[33] found that 7th and 10th graders, after watching 1 hour of selected music videos, were more likely to approve of premarital sex compared with a control group of adolescents. Whether there were long-term effects or whether the music videos actually changed the behavior of the adolescents was unknown. Another behavioral study found that violent music videos desensitized viewers to violence immediately after viewing.[34] Lack of human effects studies on heavy users of music videos and rock music, particularly heavy metal, leaves a major gap in our current knowledge.

An obvious question to ask is why there has been such an upsurge in the violent and sexual imagery of rock music. The explicitness of rock music today may be due in part to the aging of rock and roll. Rock music has always functioned to define the adolescent culture as distinct from adult society. As it has aged, however, much of the rock-and-roll culture has been absorbed into the mainstream and no longer separates "them" from "us." Former hippies and baby boomers are now parents of adolescents and many rock stars have become accepted if not embraced by the establishment. Rock music has become the voice of corporate America.[35] Eric Clapton, Phil Collins, and Steve Winwood endorse beer, the song "Revolution" by the Beatles is used to promote tennis shoes, and Michael Jackson is seen shaking hands with President Reagan. The album "Purple Rain" by rock star Prince, which contained the offensive song "Darling Nikki," has won both an Oscar and a Grammy.

The sexual freedom and recreational drug use that once were the exclusive property of young people have become an accepted part of adult behavior. The lyrics of rock and roll in the 1960s, which once so shocked parents, today seem quite tame. Adult society is already sexually and behaviorally explicit, and in order for rock music to express rebellion and autonomy, the explicitness must be taken to a higher level (*New Republic.* August 12, 1985;19:14-16).

For teenagers who identify with an alienated youth subculture, rock music must go beyond respectability to fulfill its definitional role. For these teenagers, nihilistic, violent, and at times sadistic music may express their reaction to the adult world in which they see no consistent and logical set of moral values. The music may be both a portrait of their alienation and an unflattering reflection of their perception of moral and ethical duplicity of adult society.

Conclusion

Adolescence is a challenging period under any circumstances. Young people are expected to develop a set of moral values and reconcile them with their perceptions of adult standards and behaviors. In this context, music, a prominent medium in the lives of adolescents, sends conflicting messages. Rock music, reflective of the adolescent peer culture, symbolizes the adolescent themes of rebellion and autonomy. Increasingly it does so with disturbing lyrics that connote violence and pornographic sexual imagery. In contrast to these media messages are the themes of abstinence and reasoned, responsible behavior promoted by authority figures such as parents, teachers, and government officials. At the very least, commitment to a rock subculture is symptomatic of adolescent alienation from these authority figures.

Whether, in addition to revealing adolescent alienation, explicit lyrics are also a lasting influence on adolescent values remains to be seen. Research into the effects of media messages has been problematic because of the very pervasiveness of music and its individual appeal and meaning. The effects of rock music, particularly heavy metal music, have not yet been studied extensively. As an important agent of adolescent socialization, however, the negative messages of rock music should not be dismissed.

In interactions with adolescents and their parents, physicians should be aware, and promote awareness, of the messages of music, and should nurture and encourage alternative responsible sources of information about sexuality and responsible behavior. Physicians should also educate parents about the potential influence of both music and music videos and encourage parental awareness of an adolescent's exposure to media.[32] Inasmuch as music can be representative of an adolescent subculture, questions about music preference can be corroborating evidence when other affective behavior of the adolescent suggests potentially destructive alienation. An extreme example is total immersion into a heavy metal subculture with total identification with such bands as Slayer and Metallica. Evidence, although anecdotal, suggests that these adolescents may be at risk for drug abuse[31] or even participation in satanic activities.

At the other end of the spectrum may be parents who are concerned about the explicit rock music that their well-adjusted adolescent child is listening to. Although perhaps not entirely comforting, the physician can point out that so far there is no evidence that this music has any deleterious effect on the behavior of adolescents. As a measure of its potential effect, physicians can encourage parents to question their children, in a very nonjudgmental way, about their interpretation of the music and what role it plays in their lives.

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The Future of General Internal Medicine

AMA COUNCIL ON LONG RANGE PLANNING AND DEVELOPMENT

The American Medical Association Council on Long Range Planning and Development has been publishing a series of reports that assess trends in the environment of medicine and their impact on physicians and health care provision. The Council believes that each specialty in medicine has unique characteristics and will respond differently to changes in the health care arena. This report, developed in cooperation with the American College of Physicians, the American Society of Internal Medicine, and the Society of General Internal Medicine, provides an overview and environmental analysis of the specialty of general internal medicine. The Council first reviews socioeconomic data pertinent to general internal medicine. This is followed by a review of key issues pertinent to internists that relate to such topics as graduate medical education, reimbursement, scope of practice, manpower, and competition. In the conclusions, the Council suggests activities for the medical profession to pursue in response to the identified environmental trends.

GENERAL internal medicine is a discipline composed of specialists trained broadly and extensively to meet the health care needs of most adults. An internist combines knowledge of the basic medical sciences with humanistic aspects of medicine and the intricacies of complex and serious illness. As a personal, primary care physician, the internist works with patients toward health maintenance; when illness strikes, the internist establishes the diagnosis and institutes prompt treatment. An internist has been educated to manage complex illnesses and multiple severe illnesses in the same patient. The training of internists is designed to ensure competence in the organ system specialties such as cardiology, gastroenterology, and rheumatology and in integrative disciplines such as allergy, geriatric medicine, and oncology and to prepare the general internist to provide continuous, coordinated care for adults. An internist's practice, therefore, can include a range of services from preventive medicine to comprehensive patient care to consultative services.[1,2]

Internal medicine includes 12 subspecialties recognized by the American Board of Medical Specialties in addition to general medicine: allergy and immunology, cardiovascular medicine, critical care medicine, diagnostic laboratory immunology, endocrinology, gastroenterology, hematology, infectious disease, medical oncology, nephrology, pulmonary diseases, and rheumatology.[3]

Current Socioeconomic Indicators of General Internal Medicine

Data collected by the American Medical Association reveal that in 1986 there were approximately 70 000 physicians practicing general internal medicine; they constituted 12% of the total active US physician population. Of the total number of general internists, more than 18 000 were residents in internal medicine programs.[1,2] The number of physicians in general internal medicine grew approximately 47% between 1975 and 1986. In comparison, the internal medicine subspecialty population increased by more than 138% since 1975 to a total of approximately 42 000 in 1986 (Fig 1).[1] Forty-two percent of all general internists in 1986 were younger than 35 years, compared with 25% for the total physician population (Fig 2).[1]

In 1980 there were 6164 female internists, accounting for 12% of the specialty's population. By 1986 this number had doubled, and the 12 259 female internists accounted for more than 17% of all internists. By comparison, in 1986 women physicians accounted for more than 15% of the total active physician population of 519 411. There are more women physicians in general internal medicine than in any other specialty except pediatrics.[1]

In 1986 the mean net income, after expenses but before taxes, for general internists was $93 200 compared

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Members of the Council on Long Range Planning and Development include the following: Palma E. Formica, MD, Chairman; Robert S. Stone, MD, Vice Chairman; Kim A. Bateman, MD; Alfred J. Clementi, MD; Alan C. Hartford; Richard F. Labasky, MD; Jonathan E. Rhoads, Jr, MD; C. Burns Roehrig, MD; Alex Scott, MD; John K. Scott, MD; Thomas M. Gorey, JD, Council Secretary; and Holly J. Mulvey, Consulting Author. Frank B. Walker II, MD, served on the Council during the preparation of this report.

From the Council on Long Range Planning and Development, American Medical Association, Chicago, Ill, in cooperation with the American College of Physicians, Philadelphia, Pa, and the American Society of Internal Medicine and the Society of General Internal Medicine, both in Washington, DC.

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with a mean net income for all physicians of $119 500. Between 1981 and 1986, the average net income of internists increased by almost 19% for an average annual rate of increase of less than 5% (Fig 3).[3]

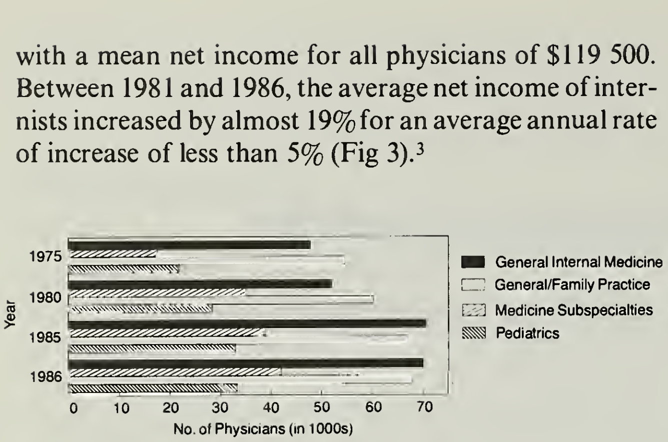

Figure 1
Trends in physician distribution by specialty for selected years.

The mean fee charged by general internists in 1987 for an office visit with an established patient was $35.30, which represents a 28% increase from 1982. Looking at the total US physician population, the mean fee charged in 1987 for an office visit with an established patient was $31.80, which represents more than a 35% increase for the same 5-year period.[3]

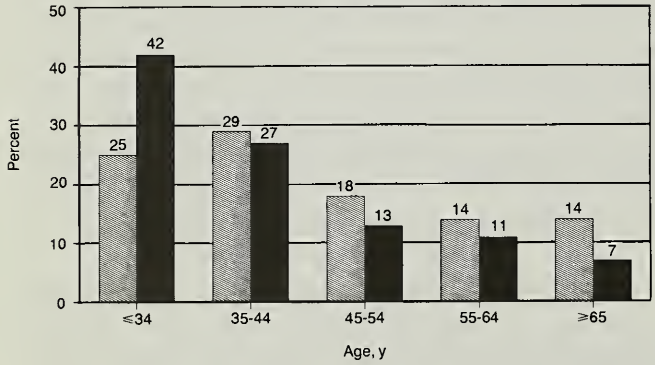

Figure 2
Age distribution of all physicians (slashed bars) and general internists (solid bars) in 1986.

While trends in professional liability have affected all physicians adversely, the financial impact on internists has been less than that experienced by physicians in many other specialties. General internists, on average, paid $5500 in professional liability premiums in 1986, an 86% increase over the amount paid in 1981. By comparison, physicians in the specialty of family practice paid an average of $7300 in professional liability premiums in 1986 and physicians overall paid average premiums in excess of $12 500, which is more than a 150% increase since 1981.[3]

General internists made more visits on hospital rounds per week in 1987 than did physicians overall (34 visits per week for internists vs 25 for all physicians). Of greater significance, however, is the fact that the number of visits on hospital rounds made by internists declined almost 14% between 1982 and 1987. Nevertheless, the decline in hospital visits was substantially less than the 22% decline experienced by physicians overall during the 6-year period.[3]

In 1987 the average number of patients cared for in the office per week by general internists was 68 compared with 64 for internal medicine subspecialists and 77 for physicians overall. The average number of patients cared for in the office per week by internists increased nearly 6% between 1982 and 1987. During the same period, the average number of patients cared for per week in an office setting by physicians overall declined by 4%.[3] The data indicate that physicians in general internal medicine are experiencing a shift in practice patterns, with fewer hospital-based patient visits and an increasing number of ambulatory/office visits. This is part of the overall decline in the use of in-hospital services (Fig 4.).[3]

In 1988 approximately 77% of nonfederal patient care general internists were full or part owners of their main practices (ie, self-employed). This percentage closely corresponds to the data collected for physicians in all specialties. In comparison, slightly more than 65% of pediatricians and almost 80% of family practice physicians were self-employed in 1988. Approximately 5% of general internists were employed by a health maintenance organization in 1988.[4]

Forces for Change

The Council on Long Range Planning and Development, in cooperation with the American College of Physicians, the American Society of Internal Medicine, and the Society of General Internal Medicine, has identified several key issues that have current and future ramifications for the specialty of general internal medicine. The issues relate to the image of the specialty, graduate medical education, funding and reimbursement, manpower, competition, and ongoing challenges. The following sections will review the factors germane to these issues and suggest their potential implications.

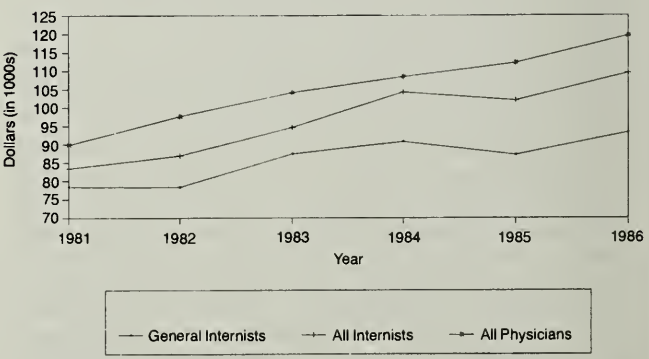

Figure 3
Net income (after expenses and before taxes) of all physicians, all internists, and general internists from 1981 to 1986.

Image of the Specialty

A key issue of concern to general internists involves the perceptions and attitudes of the public and the profession regarding the specialty. In-depth expertise in a specific area such as medical oncology or hematology, for example, often receives greater recognition than does expertise in broader-based specialties such as general internal medicine. In some measure, this may contribute to the greater status accorded to the subspecialist by the medical profession and, perhaps, the public. This is likely one of the reasons for the dramatic growth in the number of internal medicine subspecialists over the past two decades.[1,5-8]

The rate of increase in the average net income of general internists has failed to keep pace with the increases experienced by internal medicine subspecialists and physicians overall. This difference has been underscored by existing reimbursement mechanisms that, traditionally, have reimbursed procedural services at higher rates than nonprocedural services. The latter include processes such as data collection and diagnosis, which fall largely under the purview of primary care specialists such as internists. It has been argued that existing reimbursement mechanisms have created financial disincentives for medical students to choose a primary care specialty.[7-9]

Recently, attention has been focused on specialty selection by medical students. Evidence, much of which is anecdotal, indicates that a growing number of medical students perceive a career in internal medicine to be less attractive than careers in internal medicine subspecialties and other medical specialties.[7-9] Physicians, particularly those who interact with medical students, might have exacerbated the situation by focusing on the constraints that confront the practice of internal medicine rather than on the many opportunities and gratifications. They are being called on by their peers to remind themselves and their future colleagues of the satisfaction of working with patients to relieve pain and restore function as well as of the intellectual challenges of solving clinical problems. These values will remain constant despite changes in the environmental and economic structure of medicine.[8-10]

Those with an investment in the future of internal medicine have viewed with some alarm the recent trend toward a decline in the number of internal medicine residency positions being filled annually through the National Resident Matching Program. The program reports that 6736 positions were offered in internal medicine in 1985, of which more than 90% were filled. In 1989, the total number of positions offered increased to 7467, of which approximately 80% were filled. There has been a corresponding decline in the number of internal medicine positions filled by US medical school graduates, from more than 74% in 1985 to approximately 63% in 1989.[11] Factors that have led to the decline in the number of positions filled in internal medicine residency programs include a continuing decrease, albeit gradual, in the number of US medical school graduates and an increase in the number of internal medicine residency positions added to both the 1988 and the 1989 National Resident Matching Program.[2,11] Historically, specialty choice has tended to be somewhat cyclical. Over time, a variety of factors will contribute to an increase in the attractiveness of some specialties vs others.

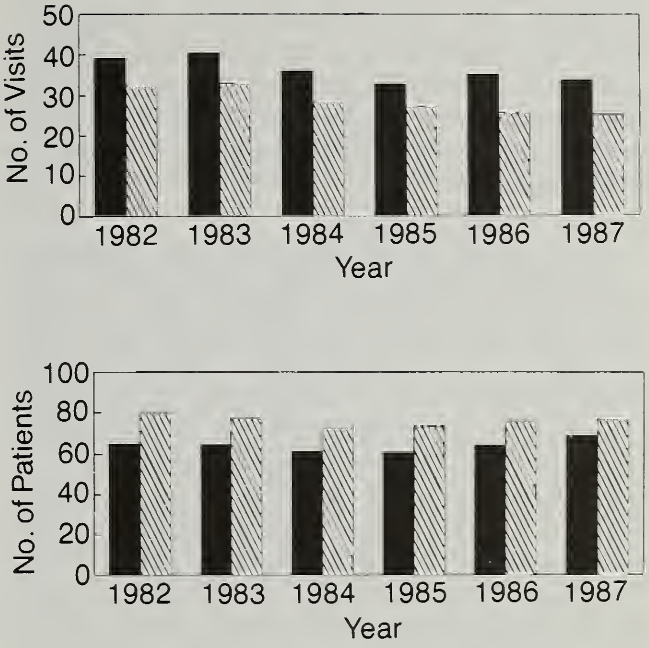

Figure 4

Top, Number of visits made on hospital rounds per week by general internists (solid bars) and by all physicians (slashed bars). Bottom, Numbers of patients cared for in the office per week by general internists (solid bars) and by all physicians (slashed bars.)

There are difficulties in correlating the number of resident-physicians in internal medicine programs with the number who intend to practice as general internists, since internal medicine residency programs frequently serve as a prerequisite for a fellowship in an internal medicine subspecialty or a residency in another specialty. Also, many resident-physicians do not finalize their decision to practice as general internists or to pursue a subspecialty or another specialty until they are well advanced in their internal medicine residency.

Studies are being initiated by the federal government to address the different reimbursement levels between primary care physicians and physicians in other medical specialties. New standards established for residency programs in internal medicine, which address concerns such as, but not limited to, the work load and work hours for resident-physicians, have the potential to offset the perceived negative aspects of residency programs in internal medicine as well. Beyond this, some residency programs are considering a further enhancement of the program in internal medicine, which would better enable residents to match their experience to their practice expectations.[12-14]

Within the medical profession, internists are communicating more actively that general internal medicine is the foundation for all medical specialties and that it provides both the challenge and the opportunity to investigate the natural course of disease, all varieties of treatment programs, and preventive medicine.[13] To ensure and further enhance this status, several recent studies call for the development of more research programs in general internal medicine.[13-15]

Graduate Medical Education

The requirements for residency programs in internal medicine are reviewed on an ongoing basis. The Residency Review Committee in Internal Medicine, under the auspices of the Accreditation Council for Graduate Medical Education, has established new residency program accreditation standards that will become effective in October 1989. The new standards stipulate that residents can work no more than 80 hours per week, averaged over 4 weeks. Additional requirements specify the range of patients for which a first-year resident should be responsible, the proportion of the residency program that should be devoted to ambulatory care, the procedures and technical skills that a resident-physician must learn, and more.[14]

The new and more specific standards have met with controversy from residency program directors who desire flexibility in applying the standards to the special conditions in their programs. But, the development of specific standards, it is countered, is in keeping with the trend throughout medicine to establish specific standards of care. Also, they will allow for greater uniformity and fairness when the Residency Review Committee determines whether internal medicine residency programs meet accreditation standards.[14]

Changes in the environment of medicine have affected most residency programs, with particular impact on primary care specialties such as internal medicine. The most salient of these changes include (1) shorter length of inpatient hospital stays; (2) increasing use of intensive care unit services; (3) diagnostic services being performed outside the hospital setting, coupled with increasing numbers of admissions for specific procedures; and (4) a shift in the composition of the patient population pool, characterized by an increase in the number of elderly patients and/or those with chronic diseases.[16]

Each of these changes will have implications for residents in internal medicine programs insofar as they will affect the numbers and types of patients cared for and the range of procedures performed. The trend toward shorter hospitalizations, largely a result of prospective payment under the Medicare program and pressures from private third-party payers, has led to an increase among the inpatient hospital population of those with long-term illness or critical illness. This is manifested, in part, by an increase in the number and use of intensive care units in the United States.[17,18]

A corollary to the declining length of stay is the trend toward admission of patients for specific procedures, based on a diagnosis that was made outside the hospital setting. The development has facilitated the transfer of diagnostic procedures and some therapies from the hospital to the physician's office or other ambulatory-care settings.

The aging of the US population also will change the types of patients encountered by residents in general internal medicine in both hospital and nonhospital settings. It is projected that between 1988 and 2025 the number of persons aged 65 to 74 years will increase dramatically.[19] Increased longevity has been accompanied by increases in chronic and disabling conditions among the elderly. On average, persons 65 years and older tend to be hospitalized twice as often as those who are younger, and they remain hospitalized 50% longer.[20] Anticipating the trend toward an increasingly elderly population, the American Board of Internal Medicine and the American Board of Family Practice are sponsoring an examination for a certificate of added qualification in the specific clinical area of geriatrics.

Although unrelated to the aging population, the spread of the human immunodeficiency virus likely will continue to affect the composition of the patient pool cared for by resident-physicians. The anticipated continued rise in the number of patients with human immunodeficiency virus and the labor-intensive nature of the progression of the disease have the potential to impact on residencies in all primary care specialties including internal medicine.

Changes in health care provision, whether in community and/or teaching hospitals or nonhospital settings, will have several implications for residency programs in internal medicine. The trend toward the admission of patients for specific procedures, based on a diagnosis that was made outside the hospital setting, raises the question of whether resident-physicians in internal medicine will receive the necessary comprehensive involvement in diagnostic and therapeutic decisions. This, coupled with the decline in the length of hospitalization, many hinder the ability of the resident-physician to become acquainted fully with patients, their families, their life-styles, and so on, all of which are important aspects of education to be a general internist.[16] Conversely, it has been noted that the shift to a more concentrated form of care in the hospital setting will provide exposure to advanced technologies and resource management as well as experience in consultation with other medical specialties.

Questions have been raised as to the future role of the general internist in a rapidly changing economic environment and whether current residency programs are providing necessary and timely skills. Additionally, it has been suggested that greater emphasis be placed on the role of research in general internal medicine residency programs.[15] A related question concerns the responsibility of the program to assist in career development of resident-physicians.[21] The past decade has witnessed a growth in general internal medicine divisions in health care centers that offer residency programs. Such divisions foster general internal medicine tracks within internal medicine residency programs, and their faculty serve as role models for the specialty.[22]

The amount of time devoted to outpatient and/or ambulatory care is a key issue in the dicussion surrounding the setting for residency programs in internal medicine. Several experimental programs are being evaluated currently; many of these are located in community hospitals and nonhospital locations. The purpose of these programs is to enhance residencies in general internal medicine by providing a broader range of "real life" experiences.[22,23] However, many residency programs now use more than one hospital and/or outpatient setting to broaden the residents' experience. Residency programs in a variety of settings, including recuperative centers, nursing homes, and assisted home care, have the potential to better prepare the internist for a practice pattern that will involve providing a broad range of personalized care for the patient.

Funding and Reimbursement Issues

Cost containment has become a major factor in health care provision. Both the public and private sectors have become involved in attempts to reduce expenditures for hospital and physician services. Issues relevant to this topic—reimbursement for physician services, managed care, and financing graduate medical education in hospital and ambulatory settings—have implications for physicians in all specialties. However, they pose particular constraints and opportunities for general internists.

Reimbursement for Physician Services.—Reimbursement for physician services affects practicing physicians as well as graduate medical education. There are substantial variations in aspects of Medicare payment, including the relative and absolute rates paid for certain services. Differences exist in the reimbursement rates for procedural services, such as endoscopy or laboratory tests, that substantially depend on the use of medical devices, and nonprocedural services, such as office visits or consultation, which use medical devices only tangentially. Primary care physicians, including internists, provide services that fall largely into the latter category. Consequently, their level of reimbursement under Medicare has been, by and large, lower than that of their colleagues who perform more procedural services.

The issues that surround Medicare payments to physicians are both complex and difficult. During the past 15 years, the federal government has endeavored to control the growth in Medicare reimbursement for physicians' services by limiting fees and by making capitation payments to private health plans. The development of fee schedules based on a resource-based relative value scale is a mechanism currently under consideration that seeks to address physician reimbursement under Medicare. Internists and other primary care physicians are monitoring developments regarding this potential reimbursement mechanism with particular interest, as a fee schedule based on a resource-based relative value scale could address many of the perceived problems with the current Medicare Part B reimbursement mechanism.

Managed Care.—Managed care attempts to control costs by using case managers who determine patient need and direct access to appropriate medical and/or hospital services. Internists are seen as well suited to serve as case managers because, in addition to their skills as diagosticians and consultants, they are able to implement complex treatment programs. Internists, therefore, are viewed as assets to a managed-care system, but whether the growth in managed care will increase significantly the demand for general internists remains to be seen. Furthermore, internists may be in competition with other primary care physicians, particularly family physicians, to provide the same services. While some have cited the growth in alternative health care provision systems as a positive trend, others have speculated that such systems may use physician services more efficiently and sparingly. Consequently, these systems might not require as many physicians to serve a given population base.[6,7,22]

Financing Graduate Medical Education.—Overall, primary care education, with an ambulatory-setting focus generates higher costs but yields lower revenues. Therefore, while many studies call for an increase in the amount of graduate medical education for internists provided in ambulatory-care settings, current Medicare reimbursement mechanisms serve as a disincentive.[23,24] A particularly important source of funding for internal medicine residency programs is the Title VII primary care training program grant, specifically, section 784: grants for training, traineeships, and fellowships in general internal medicine and general pediatrics. Although this is a limited source of federal funding, it has played a significant role in fostering important elements of primary care residencies, such as experience in ambulatory settings. Repeated testimony before Congress has indicated that many primary care residency programs would not continue without this federal support.[25,26]

The first report of the federal Council on Graduate Medical Education concludes, among other things, that the financing of graduate medical education is particularly problematic for primary care specialties and that the present system of health care financing includes incentives that tend to result in a concentration of physicians in what may be oversupplied specialties. The council calls for encouraging primary care, preventive medicine, and geriatric residency programs through expanded federal, state, and private support for the programs and through expansion of existing Title VII primary care grants.[27]

Manpower

Of the many manpower studies conducted during the past decade, perhaps the most prominent is the 1980 report of the Graduate Medical Education National Advisory Committee. The committee predicted that by the year 1990, there will be 70 000 more physicians than required to provide physician services. Regarding general internal medicine, however, the report projected a near balance between supply and requirements in 1990 (supply, 73 780; requirements, 70 250).[28]

In an effort to update and refine the manpower projections for general internists made by the Graduate Medical Education National Advisory Committee, several studies have been conducted. In 1987 the Federated Council for Internal Medicine used the model developed by the committee as a baseline, adjusted the model to reflect additional factors (such as changes in demographic trends, in the incidence and prevalence of disease, and in organizational forms), and continued the projections for specialty-specific physician supply and requirements beyond the year 1990. The study estimates that in the year 2000 the total physician supply in general internal medicine will be 90 783, while the total number of required physicians in the specialty will be 95 501. The study maintains that the difference in physician supply/requirements represents a shortage of more than 4700 physicians in general internal medicine, which is approximately 5% (Federated Council for Internal Medicine, unpublished data, November 1987). In addition, the Council on Graduate Medical Education has concluded that there is an impending undersupply of physicians in general internal medicine.[27]

A related factor that affects manpower considerations is the amount of time spent in practice. Two significant variables are the number of women and the number of young physicians in the specialty. Throughout the projection period, 1986 to 2000, the number of female internists is projected to increase. Women physicians tend to spend less time in practice and to care for fewer patients than their male counterparts.[5] In addition, survey results indicate that young physicians, both men and women, are choosing to devote less time to clinical practice than are their older colleagues. It is likely that those in internal medicine share this characteristic (American Medical Association Ad Hoc Committee on Young Physicians, unpublished data ["Surveys of Young Physicians Report"], October 1985). Another related factor that has the potential to decrease the amount of time spent in practice by internists is an increase in time spent in non-patient-care activities such as management and administration, quality assurance, and utilization review.

Competition

The current and projected demographics of the US population, among other factors, indicate a continuing demand for the services of internists. Nonetheless, internists will continue to face competition for the provision of primary care services. This competition will be generated primarily by other internists, physicians in other primary care specialties (such as family practice), and physicians in internal medicine subspecialties.

The greatest source of competition is likely to come from internal medicine subspecialists. Graduate medical education requirements have provided subspecialists with a sound basis in the fundamentals of general internal medicine. It is not anticipated that the dramatic increase in the number of subspecialty internists will be matched by a corresponding increase in the demand for subspecialty services. Physicians in some specialties may expand the range of services they provide in attempts to ensure a larger, more stable, patient base. Therefore, it is likely that the practice of some subspecialists could consist largely of general internal medicine.[6] An alternative scenario can be developed based on the assumption that increased competition would result in narrower areas of specialization. Under this scenario, physicians would establish a defined scope of expertise and offer a limited range of services in that area.[5]

Continuing Challenges

Unresolved issues, such as treatment of terminally ill patients, do-not-resuscitate orders, and transplantation of organs, will continue to challenge physicians in the decades ahead. General internists provide a broad range of care for the adult population; therefore, many of these issues will fall within the scope of their practice. As changing circumstances, such as an increased use of sophisticated health care technology, expand the range of ethical issues, it will be important for graduate and continuing medical education in internal medicine to keep pace.

Current and future internists will need the expertise to deal with social and health issues such as increased substance abuse, occupational and environmental health risks, and the spread of the acquired immunodeficiency syndrome virus. Increasingly, physicians will need to work with community resources to ensure that patients have appropriate follow-up care. Such care may involve nonmedical considerations, such as working with a team of medical and nonmedical personnel or with a variety of organizations and government agencies. Internists, as providers of care to the adult population, will have to acquire both the information and the skills that will enable them to effectively manage this extended form of health care provision.

The implications that these challenges pose for internists are significant. In a health care provision system that is growing increasingly bureaucratic, patients will look to their primary care physician for counsel and guidance. Medical decision making and resource allocation will become increasingly complex. Internists will need to be current on issues that contribute to the ethical and social milieu in which they provide patient care. Nevertheless, because of the broad scope of the care they provide, and their position on the front line of these issues, internists can play a key role in ongoing deliberations, within and particularly outside of the medical community, regarding the future of health care provision. Now, and in the future, they have an opportunity to serve as advocates for their profession and, especially, the patients they serve.

Implications

In summary, the following factors are likely to affect the future of general internal medicine:

- New approaches to graduate medical education in internal medicine, such as modifications in work hours for resident-physicians; curriculum changes that may allow resident-physicians the option of targeting their medical education to their expected practice pattern; and a shift to more experience in ambulatory-care settings, may increase the attractiveness of this specialty to medical students.
- Factors such as the development of sophisticated diagnostic technology, expanded care being provided in ambulatory settings, the aging of the US population, and changes in the types and severity of illnesses encountered by resident-physicians in hospitals likely will continue to reshape residency programs in internal medicine.
- Modifications in reimbursement mechanisms for physician services are expected to address favorably the level of compensation for services provided by general internists.
- The rapid growth in the number of internal medicine subspecialists, and the potential for competition from this population as well as other specialists, may affect the number and types of services performed by some internists.
- A potential decline in the amount of time young physicians devote to practice could offset the anticipated growth in the actual numbers of general internists.
- The changing demographics of the patient population, in particular the increasing number of elderly persons, will affect the types of patients cared for by internists and the nature of the illnesses that they treat and potentially could increase the use of the services of general internists.
- The continuing challenges to health care provision, such as ensuring access to medical care for the poor and other underserved groups, ongoing advances in information, computer, and health care technology, and the expanding number of social problems and ethical issues that affect health care provision, will continue to affect the practices of most general internists.

Conclusions

To address the trends that will affect general internists, the medical profession will need to be creative and aggressive as well as united. Among the several opportunities to pursue are the following:

1. Adjust to meet the changing demographic characteristics of current and future patients by being prepared to deal with the nature of the illness in the elderly, the evolution of new diseases, and the changing demands in the organization and financing of health care provision.
2. Promote actively an understanding of the role and function of the general internist to enhance public awareness and medical student perceptions. Further, strive to provide all medical students, especially those interested in primary care specialties such as general internal medicine, with a fair-minded and balanced perspective of the challenges as well as the gratifications afforded by the practice of medicine.
3. Continue to address the challenge of ensuring adequate funding of graduate medical education and the maintenance of fellowship and research opportunities. In addition, ensure that the content of residency programs in internal medicine continues to be both comprehensive and relevant and to reflect changes in demographics, science and technology, economics, and practice styles.
4. Advocate the needs and goals of general internal medicine at all levels of government and private agencies. In particular, work to ensure a rational and equitable payment system for physician services. Family physicians, subspecialists in internal medicine, and internists share many interests and can work together effectively on many issues.
5. Convince both the private and public sectors of the continuing need for increased funding for biomedical research. Endeavor to expand the role of research, to include the area of health services research, to provide a sound basis for the development of cogent health policy. Assume a leadership role by contributing to decisions regarding health care provision and financing.

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MARK YOUR CALENDAR

198TH ANNUAL MEETING
CONNECTICUT STATE MEDICAL SOCIETY
MAY 9, 10, 1990
RAMADA INN, MERIDEN, CONNECTICUT

MAY 9 — ANNUAL MEETING OF THE HOUSE DELEGATES
MAY 10 — CSMS SECTION MEETINGS

How to Comply with the Medical Waste Tracking Act of 1988

KYLE L. BALLOU, J.D.

Editor's Note: The following information is a summarization of the Medical Waste Tracking Act of 1988 (MWTA). The Connecticut State Medical Society is concerned that some physicians are unaware of the MWTA. Since there have been some steep fines levied recently against generators we provide this information so that physicians are in compliance with the law.

Further information is available by calling Kyle L. Ballou, Esq., at the Connecticut State Medical Society, 1-800-635-7740; RCRA (Resource Conservation Recovery Act) hotline, 1-800-424-9346; or William Howard at the Connecticut Department of Environmental Protection's Bureau of Waste Management, 566-5847.

The Medical Waste Tracking Act of 1988

New federal regulations governing the identification segregation, packaging, labeling, marking, storing, and tracking of medical waste went into effect on 22 June 1989.

MWTA was enacted as a response to public concern over the degradation of shoreline areas, particularly in Connecticut, New Jersey, and New York, and establishes a "cradle to grave" system to track medical waste.

The Act defines "medical waste" as any waste "generated in the diagnosis, treatment or immunization of human beings or animals in research thereto, or in the production or testing of biologicals."

Types of Medical Waste

The MWTA designates the medical waste in the following classes be tracked:

1. **Cultures and stocks of infectious agents and associated biologicals.**
   Included within this class: cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate, and mix cultures.
2. **Pathological wastes.**
   Human pathological wastes, including tissues, organs, body parts, and body fluids that are removed during surgery or autopsy, or other medical procedures, and specimens of body fluids and their containers.
3. **Human blood and blood products.**
   (1) Liquid waste human blood; (2) products of blood; (3) items saturated and/or dripping with human blood; or (4) items that were saturated and/or dripping with human blood that are now caked with dried human blood; including serum, plasma, and other blood components, and their containers, which were used or intended for use in either patient care, testing and laboratory analysis, or the development of pharmaceuticals. Intravenous bags are also included in this category.
4. **Used sharps.**
   Sharps used in animal or human patient care or treatment or in medical, research, or industrial laboratories, including hypodermic needles, syringes (with or without the attached needles), Pasteur pipettes, scalpel blades, blood vials, test tubes, needles with attached tubing, and culture dishes (regardless of the presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips.
5. **Animal waste.**
   Contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research, production of biologicals, or testing of pharmaceuticals.
6. **Isolation waste.**
   Biological waste and discarded materials contaminated with blood, excretion, exudates, or secretions from humans who are isolated to protect others from highly communicable diseases, or isolated animals known to be infected with highly communicable diseases.

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7. **Unused sharps.**
   The improper disposal of sharps has, in some areas, presented sufficient potential health hazard and environmental degradation for local officials to restrict public access to beaches. Thus, EPA has elected to include the following unused, discarded sharps as a class of regulated medical waste: Hypodermic needles, suture needles, syringes, and scalpel blades.

Small Generator Provisions

A physician who produces less than 50 lbs of regulated medical waste per calendar month (ie, a "small generator" and does not transport more than 50 lbs of such waste offsite in any one shipment does not have to prepare a medical waste tracking form. However, such generators ***are required to maintain logs*** recording each of their shipments of less than 50 lbs. Be advised, however, that this provision **does not exempt the small generator from the pre-transport requirements of the regulations** (ie, the requirements to properly package, label, mark, and store regulated medical waste).

Pretreatment Standards

Physicians who generate regulated medical waste and arrange for off-site transport of such material must comply with the following provisions:

1. Segregate regulated medical waste into sharps, including sharps containing residual fluids, and fluids in quantities greater than 20ml from all other medical waste (as well as to segregate these wastes from each other).
2. Package all regulated medical waste in rigid, leak-resistant containers. **Note:** The combination of a plastic bag and a rigid cardboard box generally satisfies the packaging performance standard. However, there are exceptions. Sharp items are required to be packaged in puncture resistant packages. Body fluids in quantities of 20ml or more must be in break-resistant packages that are capable of being tightly sealed.
3. Store on-site regulated medical waste in a manner that protects it from weather, animals, or unauthorized access.
4. Ensure packaging requirements are met prior to off-site transport (Transporters should be willing to lend assistance).
5. Label and mark all packages of regulated medical waste.

   Note 1: The outer most surface of *all* containers must be marked with the name and address of the generator (ie, physician). In addition, the name and address of the generator and the transporter's EPA ID number and the date of off-site transport must be marked on the outer surface of each package. All containers must also be labeled with either the universal biohazard symbol or the words "infectious waste" or "medical waste."

   Note 2: Use of a red bag as a container is an indication that the bag contains untreated regulated medical waste and serves the same function as the label. However, a label is always required on the outer surface of an untreated, regulated medical waste package, regardless of the color of the packaging.

   Note 3: The generator's signature on the tracking form constitutes certifcation that the waste is packaged, labeled, and marked properly.

Transport In Excess of 50 LBS.

A physician who arranges for the transport of 50 lbs or more of regulated medical waste must: 1) meet all pre-transport requirements; 2) complete a manifest form prescribed by the EPA; 3) deliver at least four copies of the manifest to the transporter retained for off-site removal of the regulated medical waste; and 4) obtain proof that such a transporter has an EPA Medical Waste Identification Number.

Enforcement Provisions

The EPA may assess a civil penalty of up to $25,000 per day for **each violation** of the MWTA. Criminal penalties of up to $50,000 per day of violation or two years imprisonment may be assessed if a person knowingly violates the MWTA. Repeat offenders are subject to double the maximum penalties.

It should be noted that the MWTA gives a duly designated EPA official or representative the authority to come on site and inspect a facility for the purposes of compliance.

Low-Level Radioactive Wastes

AMA COUNCIL ON SCIENTIFIC AFFAIRS

Under a federal law, each state by January 1, 1993, must provide for safe disposal of its low-level radioactive wastes. Most of the wastes are from using nuclear power to produce electricity, but 25% to 30% are from medical diagnosis, therapy, and research. Exposures to radioactivity from the wastes are much smaller than those from natural sources, and federal standards limit public exposure. Currently operating disposal facilities are in Beatty, Nev, Barnwell, SC, and Richland, Wash. National policy encourages the development of regional facilities. Planning a regional facility, selecting a site, and building, monitoring, and closing the facility will be a complex project lasting decades that involves legislation, public participation, local and state governments, financing, quality control, and surveillance. The facilities will utilize geological factors, structural designs, packaging, and other approaches to isolate the wastes. Those providing medical care can reduce wastes by storing them until they are less radioactive, substituting nonradioactive compounds, reducing volumes, and incinerating. Physicians have an important role in informing and advising the public and public officials about risks involved with the wastes and about effective methods of dealing with them.

UNDER a federal law passed in 1980 and amended in 1985, all states by January 1, 1993, must provide for safe disposal of low-level radioactive wastes (LLRW) generated within their borders. Hospitals and physicians generate 25% to 30% of the wastes, and the 50 states produce a total of about 2.7 million cubic feet each year in civilian applications.[1] What are the sources and makeup of the wastes? How are the states planning to comply with the laws while ensuring the safety of their citizens and their participation in the process?[2] What are the environmental and technological factors that must be considered in developing disposal facilities? This report considers such issues, summarizes the progress of 1 state, and makes recommendations about how physicians can help with the problem.

Background and Definitions

Radioactive wastes may be classified into five categories according to their origin, content of radioactivity, and hazard[3]: spent fuel from nuclear power reactors; high-level wastes, which include materials remaining after the separation of uranium and plutonium from fuel rods for nuclear reactors; transuranic wastes, which consist of elements with atomic numbers higher than that of uranium and extracted during the reprocessing of fuel rods; uranium and thorium mine and mill tailings, which include large amounts of radium and its decay products; and LLRWs.

Low-level radioactive wastes are defined by what they do *not* include[3]: they do not include spent fuel, high-level radioactive wastes, more than 3700 Bq/g (100 nCi/g) of transuranics, or mine or mill tailings. The wastes may be in solid, liquid, or gaseous form. About 57% of LLRWs by volume and 80% by content of radioactivity result from activities and procedures associated with generating nuclear power[4,5]; these wastes include paper, glass, plastic, cloth, filtration materials, resins, sludges, and metal materials. Some wastes result from industrial uses of ionizing radiation such as manufacturing smoke detectors and exit signs, measuring thicknesses and concentrations, and examining the structures of manufactured products. A total of 25% to 30% of the wastes by volume

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From the Council on Scientific Affairs, American Medical Association, Chicago.

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This report is not intended to be construed or to serve as a standard of medical care. Standards of medical care are determined on the basis of all of the facts and circumstances involved in an individual case and are subject to change as scientific knowledge and technology advance and patterns of practice evolve. This report reflects the views of the scientific literature as of December 1988.

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result from medical uses.[1,4] The nation's inventory of LLRWs accumulated to 1984 made up about 84% by volume of all radioactive wastes, and it contained 0.1% of the total radioactivity in the wastes.[5]

In 1985, about 20,000 civilian facilities in the United States produced 2.68 million cubic feet of LLRWs with an activity of 28 x 10^9 MBq (749 100 Ci).[6] The federal government, which has its own facilities for storing wastes, produced a similar volume that had twice as much radioactivity. These volumes represent only a minuscule proportion of all wastes generated in the nation through agriculture, mining, and industry and in homes.

In medicine, LLRWs may be related to diagnosis, treatment, or research.[7] Diagnostic procedures may involve virtually any body system and may yield wastes of short-lived gamma ray emitters such as technetium Tc 99m, indium 111, and thallium 201. Wastes from treatment often include longer-lived beta or gamma ray emitters such as iodine 131 and phosphorus 32, and they may include those from sealed sources of iodine 125 and iridium 192, which have half-lives of 60 and 74 days. Wastes from nuclear power reactors and other nonmedical uses include iridium 192, cesium 137 (half-life, 30 years), and cobalt 60 (half-life, 5 years).[6] In terms of radioactivity, cesium 137 makes up almost all LLRW from nuclear power reactors; strontium 90 (half-life, 29 years) and iodine 129 make up much smaller proportions of the wastes.[8]

Biomedical research may involve the use of radioisotopes in such diverse projects as exploring enzyme kinetics, determining the distribution of drugs in body fluids, or studying the structure of nucleic acids. Wastes from research and teaching applications may include hydrogen 3 (tritium), carbon 14, phosphorus 32, and sulfur 35, with half-lives that range from 14 days for phosphorus 32 to 5730 years for carbon 14. Technetium Tc 99m, with a half-life of about 6 hours, and hydrogen 3, with a half-life of about 12 years, are two of the most widely used radionuclides.

Risks

Low-level radioactive wastes may emit alpha, beta, or gamma radiation and in some cases neutrons or combinations of these forms. Alpha radiation is the least penetrating type and can be stopped by the skin.[7] However, it can damage lung tissues if substances emitting it, such as radon gas, are inhaled. Beta radiation can penetrate the skin and also can present a hazard to internal tissues. Gamma radiation, which is similar to x-rays, can be attenuated effectively by dense materials such as concrete or lead. Any ingested source of ionizing radiation may damage tissues; the adverse effects would depend on the dose the source delivered and the sensitivity of the tissues.

Although the volumes of LLRWs generated by power companies, other industries, and medical institutions may be large, volumes can be diminished and their handling made easier by compaction, incineration, or evaporation.[7] Many radionuclides used in clinical medicine have relatively short half-lives and may be stored until they have decayed to background levels, then disposed of through the institution's trash disposal system. Also, scintillation fluids and animal carcasses containing less than 1850 Bq (0.05 μCi)/g of hydrogen 3 or carbon 14 may be disposed of without regard to their radioactivity.[9] However, any other hazard related to these materials needs to be considered.

Under national standards set by the US Nuclear Regulatory Commission (NRC) in the Code of Federal Regulations (10 CFR 61), which apply to LLRW disposal facilities, releases of radioactivity from the nuclear fuel cycle affecting any member of the public must not exceed 0.25 mSv (25mrem)/y to the whole body or 0.75 mSv (75mrem)/y to the thyroid. A dose of 0.25 mSv approximates the amount received annually by the average person because of natural exposure to cosmic rays[10] and is much less than the average annual exposure per person, 3 mSv (300 mrem), received from all natural sources.[11]

The toxicity of all LLRWs, if combined, is relatively low per unit of volume, and after 100 years it would approximate that of soil if the content of naturally occurring radium and heavy metals in the soil were considered.[12] Eisenbud[13] estimated that LLRWs from uses in biology and medicine contribute less than 0.01 mSv (1 mrem) to each person's annual radiation exposure; the latter is about 3.6 mSv (360 mrem) per person.[11] Fallout from atmospheric testing of nuclear weapons also may be responsible for exposure of 0.01 mSv (1mrem) per year.[11]

The US Environmental Protection Agency (EPA) estimates that annual exposures of persons living near a disposal facility would be almost 0 to 0.1 mSv (10 mrem) per person, depending on the method of construction, geological characteristics of the area, rainfall, and other factors. The EPA intends to develop environmental standards for the disposal of LLRWs covering exposures to the public from managing and processing the wastes; exposures to the public from disposing of the wastes; groundwater protection; wastes that are "below regulatory concern"; and higher-activity, naturally occurring, and accelerator-produced radioactive wastes (F. L. Galpin and W. F. Holcomb, presentation before American Institute of Chemical Engineers, Minneapolis, Minn, August 16-19, 1987). In some instances the groundwater standards will be those of drinking water. The EPA agrees with the NRC standard, which is that exposures of the public should not exceed 0.25 mSv (25 mrem) per person per year.

Disposal Facilities Past, Present, and Future

Prior to 1963, federally owned and supervised sites and facilities received all LLRWs generated in the nation.[4] In that year, this disposal service was discontinued, and the US Atomic Energy Commission began to license commercial facilities to receive the wastes. By 1971, licensed facilities existed in Illinois, Kentucky, Nevada, New York, South Carolina, and Washington. During the 1970s, however, reports began to circulate that improper packaging and insufficient compacting of the wastes, theft of contaminated tools, and contamination of groundwater were occurring at the facilities. Although no adverse public health effects were shown,[4] opposition to the facilities by the public and state governments mounted; by 1979, facilities in Illinois, Kentucky, and New York had closed, and the remaining ones were threatening to close.

Reacting to the threat, Congress in 1980 passed the Low Level Radioactive Wastes Policy Act (Public Law 96-573), under which each state eventually would become responsible for ensuring proper disposal of LLRWs generated within its borders through civilian activities.[2] In the act Congress stated that disposal facilities could best be provided through compacts, or agreements, among regional groupings of states, but it did not designate the groupings. Also, it stated that after January 1, 1986, any regional facility would be allowed to exclude wastes from states outside of the region.

After passage of this legislation, most action in the states concerned discussions about whether to join a compact and, if so, which one.[2] Once a compact was formed, negotiations were needed among the member states and formal agreements had to be signed. All of the states wanted to protect the interests of their citizens, and an overriding issue was which state would have the first disposal facility for the region. Another issue was the sharing of liability in the event of an inadvertent escape of radioactivity.

Progress toward the 1986 deadline was slow despite pressure from the three states with operating disposal facilities. In 1985, Congress intervened and passed amendments to Public Law 96-573. These set a series of deadlines for states in planning and licensing disposal facilities; outlined financial penalties if the states did not develop sites; and specified that after December 31, 1992, parties generating LLRWs in states without facilities could ask their states to take possession of the wastes, and the states would assume legal liability if they did not do so.

At present, facilities for LLRWs remain open at Beatty, Nev, Richland, Wash, and Barnwell, SC; the latter receives about half of the LLRWs generated in the United States[2] but is scheduled to close on January 1, 1993. Table 1 shows the status of regional compacts and the states that have not joined compacts as of March 1989. "Host states" are those in which the first disposal facilities will be located.

Selecting Disposal Sites

The NRC is responsible for rules and regulations pertaining to the disposal of radioactive by-products, and it may allow states with appropriate enabling legislation and approved radiation protection agencies and programs, called "Agreement States," to assume this responsibility. At present about half of the 50 states, including Illinois, are Agreement States, and others are preparing to apply for this status. Illinois and Pennsylvania are "host states" for their respective compacts and are making progress in preparing the regional disposal facilities that they will regulate. Information and materials are available from the Illinois Department of Nuclear Safety (Thomas A. Keer, [217] 524-6417) and the Pennsylvania Department of Environmental Resources (William P. Dornsife, [717] 787-2163) that describe the many issues and processes involved in planning the facilities.

Table 1.—Status and Makeup of Regional Compacts

Compacts Approved by Congress and President	
Northeast Connecticut (host state) New Jersey (host state)	**Central Midwest** Illinois (host state) Kentucky
Southeast North Carolina (future host state) Alabama Florida Georgia Mississippi South Carolina (host state) Tennessee Virginia	**Central** Nebraska (host state) Arkansas Kansas Louisiana Oklahoma
Midwest Michigan (host state) Indiana Iowa Minnesota Missouri Ohio Wisconsin	**Rocky Mountain** Nevada (host state) Colorado New Mexico Wyoming
Appalachian Delaware Maryland Pennsylvania (host state) West Virginia	**Northwest** Washington (host state) Alaska Hawaii Idaho Montana Oregon Utah
Compact Pending Approval of Congress	
Southwestern Arizona California North Dakota South Dakota	
States Not in a Compact	
Maine Massachusetts New Hampshire New York	Puerto Rico Rhode Island Texas Vermont Washington, DC

Selecting a disposal site and preparing and operating a facility in a manner that will ensure public safety and maintain environmental quality are complex undertakings that involve legislation, government oversight, public participation, financing, engineering and technology, supervision, surveillance, and quality control over a period of decades. Table 2 lists some steps in the process.

Table 2.—Processes, Procedures, and Factors in Developing Disposal Facilities for Low-Level Radioactive Waste

Enabling legislation; decision about agency or group to have responsibility for construction and operation
Selection of favorable and unfavorable site factors; survey of state for possible sites; selection of site; selection of contractor
Public participation in site selection process; open meetings and active public relations programs; provision for continuing oversight by public board or committee; involvement of knowledgeable professionals
Determination of financial benefits that will accrue to municipality and county hosting facility
Development of facility's design and specifications; specification of forms for receiving and storing wastes
Financing of construction and operation; determination of rate and fee structure and costs to be met
Ensuring quality control during construction; ensuring quality control during operation, including receiving, transporting, record-keeping, and checking integrity of waste containers
Monitoring of air, water, and ground in and around facility; monitoring health of population around facility; monitoring health of workers at facility
Preparing for emergencies and emergency closures; planning for closure and monitoring of facility after useful life
Funding for contingencies and legal costs
Maintaining good relations with other states in the compact; deciding on use of facility by other states

Illinois, the host state for the Central Midwest Compact, is making progress in managing its LLRWs, and the procedures it has followed are informative. Through a state law passed in 1983, the Illinois Department of Nuclear Safety (IDNS) received authority to develop a program and select a site for a disposal facility, and Illinois became an Agreement State in 1986. The Illinois facility will be financed completely by fees paid by the generators of LLRWs.

Officials selecting the site for the Illinois facility considered it essential that the facility be located where there would be no opposition by a county or municipal government. Beginning the process, the IDNS identified counties in Illinois with an interest in having the facility, and it also identified counties having favorable geological characteristics. Twenty-three counties met these criteria. Using the state's computer-based Geographic Information System and considering "exclusionary" and "favorability" factors, the IDNS identified 72 possible sites, each at least 4 square miles in area.

Under the Illinois approach, "exclusionary factors" consisted of the presence of a floodplain or standing water, earthquake history, designated and protected lands, and the possibility of landslides. "Favorability factors" related to absence of shallow aquifers, low soil permeability, lack of sand and gravel, lack of high-yield groundwater aquifers, simple geological structure, low erosion potential, and not being in a watershed for surface water supplies. Other important factors related to population concentrations, presence of prime farmland, existing industry and projected industrial development, presence of endangered species, and presense of archeological, cultural, or historical sites.

Aridity and lack of precipitation simplify the management of radioactive and other types of wastes.[14] Stabilizing the wastes and selecting a site with hydrological and geological features that minimize movement of contaminants are other key factors.[15] While it is known that radioactive substances can be stable in geological strata over thousands of years, the episode at Maxey Flats, Kentucky, in which radiation-containing materials moved through soil and contaminated water and milk, and other episodes in which water infiltrated disposal sites[4] illustrate the hazards that must be prevented.

In 1988 the IDNS designated two sites for detailed geological and environmental studies. The first site is located near Martinsville, a city in central Illinois near the eastern border. The Martinsville City Council and surrounding townships expressed strong support for the LLRW program, and the IDNS began detailed studies of this site in June 1988. The second site is near the town of Geff, in Wayne County in southeastern Illinois. Members of the Wayne County Board unanimously supported location of the LLRW disposal facility in that county. After completion of studies in both places and with the approval of the local government, the IDNS in late 1989 will make a final decision about location of the disposal facility.

Building and Financing Facilities

Future disposal facilities for LLRWs probably will make use of multiple-engineered safeguards to isolate the wastes, concentrating and stabilizing them, placing them in strong-walled containers that will maintain their integrity, preparing a type of facility above or below ground that will minimize any escape of radioactivity or radiation that might affect people or the environment, and controlling access.[6] The Central, Central Midwest, Midwest, and Northeast compacts, and some states such as Pennsylvania, have specified that the facilities must be aboveground; other states will allow shallow land burial.

Protection against disruption of the facility by people or natural forces will be sought. Monitoring of the containers and of groundwater and air will be basic features, as will protection of workers at the facility and of persons living nearby. Some of these activities will continue long after the disposal facility is closed.

In the past, facilities built for LLRWs utilized "shallow land burial," the wastes being placed in wide trenches 25 ft deep. Sand, gravel, and crushed stone cover the bottom of the trenches to a depth of several feet. Containers are inspected and then placed into the trenches by crane, and the wastes with high levels of radioactivity are segregated. Sand is forced into the spaces among the circular containers. When the facility reaches its capacity, clay, gravel, topsoil, and grass are used to cover and restore the area. Other approaches have utilized underground cells with walls of reinforced concrete or boreholes that have steel liners and wide caps of concrete. In all cases, records are maintained of the locations of wastes.

In general, it is expected that those who generate the LLRWs will pay the costs of transporting and storing them. Costs for medical institutions probably will be variable: at Children's Memorial Hospital in Chicago, Ill, the costs per year are negligible; at a medium-sized hospital in LaGrange, a suburb near Chicago, and at a hospital in Princeton, a town in rural Illinois, costs per year also are low. In contrast, the Mayo Clinic in Rochester, Minn, each year produces 6000 cu ft of LLRWs, and the disposal costs might reach \$50/cu ft[7]; to reduce the costs the clinic uses storage and incineration.

In 1987, the University of Cincinnati (Ohio) disposed of 1755 cu ft of LLRWs that contained 3.3×10^{10} Bq (0.9 Ci); the total cost of disposal was \$53,445 (G. W. Alexander, Jr, written communication, May 16, 1988). In 1985, the cost of shipping a 55-gal drum from New York, NY, to Washington State and disposing of the contents was \$400.[9] Arranging for disposal of the wastes is becoming increasingly difficult (E. Party, MS, oral communication, May 8, 1989). Several authors have reviewed aspects of the problem, listed some points about which investigators might be watchful, and suggested actions that might be taken to solve the problem and reduce costs.[9,16]

Eisenbud[17] estimated that if an engineered disposal facility cost \$10 million, if one case of cancer occurred after every 200 person-rems (20 person-Sieverts) of exposure, and if 100 persons near the facility each were exposed annually for 50 years to a dose of 0.003 mrem (0.00003 mSv), which according to NRC regulations is conceivable, then the cost of preventing one case of cancer among the 100 persons would be hundreds of billions of dollars. In contrast, the cost of saving a life by screening for cervical cancer is $25,000.

Transporting Wastes

Low-level wastes usually are reduced in volume before they are shipped, which decreases costs and increases the safety of handling, shipping, and storage and also increases concentrations. Compaction can reduce volumes by 90% and incineration by 95%, with most of the radioactivity remaining in the ash. Wastes are classified by the NRC on the basis of radioactivity per unit of volume. Class A wastes, those with the least radioactivity, require only safe handling and packaging. Class B and class C wastes must be stabilized to keep their size and shape for 300 years and may be stored together. Class C wastes, which have the greatest concentrations of radioactivity, must include barriers against intrusion that are effective for 500 years. Any form of LLRW may be packaged in a high-integrity container of plastic, steel, or concrete that will last 300 years.

Methods for transporting radioactive wastes vary according to the number of becquerels involved, the concentration of the wastes, the type of vehicle utilized, and the potential for escape of radioactivity to the environment.[4] About 90% of LLRW contains low radioactivity and may be shipped in wood or steel boxes.[6] Material that is moderately radioactive must be shipped in more secure containers, usually 55-gal metal drums. Containers for highly radioactive materials are very rugged; some have double steel walls 1½ inches thick surrounded by 3½ inches of lead shielding. This type of container must pass severe damage tests including a 30-ft drop onto a steel rod, submersion, and exposure to a fire of 1475° F (802° C) for 30 minutes.

Some institutions contract with licensed brokers who collect and dispose of the wastes. Past experience with millions of shipments indicates that current precautions and standards have shielded the public and protected the environment adequately.[4] During 40 years of transportation operations, no person has been shown to have been injured by the radioactivity in a shipment of wastes.[6]

Past AMA Actions

In 1979, the American Medical Association (AMA) House of Delegates adopted Resolution 44 (1979 Interim Meeting) urging the NRC to allow separation of LLRWs from those of higher activity and to encourage the establishment of disposal facilities for LLRWs.

Resolution 171 (1979 Interim Meeting) directed the AMA to monitor the safety of nuclear power and to initiate model legislative action through state medical societies that would facilitate the safe disposal of LLRWs. The Council on Scientific Affairs thereafter prepared the report "Risks of Nuclear Energy and Low-Level Ionizing Radiation"; Recommendation 4 of that report stated that local laws should be modified to allow disposal of LLRWs utilizing model legislation developed by the AMA. In June 1980, the AMA's Department of State Legislation developed a model bill on the subject.

In November 1979, L. M. Freeman, MD, testified before Congress on behalf of the AMA that inability to dispose of LLRWs threatened the availability of diagnostic and therapeutic procedures. Dr Freeman emphasized that new disposal sites and procedures to reduce volumes of LLRWs were necessary.

In March 1985, the AMA wrote Senator Thurmond, chairman of the Senate Judiciary Committee, supporting the development of regional facilities for disposing of LLRWs and emphasizing the need to establish regional sites. The AMA's letter noted the important contributions of radiopharmaceuticals and radionuclides to the diagnosis and treatment of disease.

Comment and Summary

Without doubt, the benefits of the activities giving rise to LLRWs outweigh the hazards that are associated with the wastes, provided that the latter are treated in accordance with existing standards and the well-understood principles of radiation protection.

Congress has passed laws specifying that by January 1, 1993, all states must be responsible for disposing of their own LLRWs. If a state has not made arrangements by then to store its wastes at a regional facility or at its own disposal site, the state may be asked by those generating the wastes, for instance, power plants and hospitals, to assume all liability for any effects of the wastes. This emphasizes the need for each state to progress in a timely fashion toward meeting the 1993 deadline.

About 120 million nuclear medicine procedures are carried out each year,[6] and 25% to 30% of all LLRW is produced by physicians, physicists, pharmacists, scientists, technologists, and others involved with diagnosis, treatment, and medical care.[3,4,16] Those in universities, medical schools, and larger hospitals and laboratories are most likely to generate the wastes. Their activities benefit not only individual patients but society as a whole in terms of basic science studies and research. For example, about 90% of new drugs require evaluation using radioisotopes.[1]

Hospitals, clinics, and physicians' offices can diminish the hazards of LLRWs by incinerating them, which reduces the volume of liquids, storing the substances until their radioactivity falls to safe levels, or substituting nonradioactive compounds. With incineration, the cost, licensing, and local approval of use of the incinerator may pose difficulties.[18] Increasing the importance of these measures is the likelihood that those generating the wastes will be expected to pay the costs of the disposal facilities. The facilities are likely to be expensive. About 235,000 cu ft of wastes is generated each year in the states of the Appalachian Compact, and the cost of storing the wastes is estimated to be $100 to $200 per cubic foot; thus, the annual cost of the facility conceivably could reach $47 million.

All physicians, including those in clinical practice as well as those in public health, and especially physicians in radiology and nuclear medicine, should help their states develop safe disposal facilities for LLRWs. With their training and background in the physiology of disease and their knowledge about risks to health, physicians should be able to provide advice and perspective about the radioactive wastes to those in government, public agencies, and industry who are responsible for making decisions about the problem.

Physicians have an important role in informing the public about the relatively small magnitude of risks associated with LLRWs. They should become familiar with the issues and inform their patients. They may have opportunities to communicate with the media and can lead discussions in classrooms and among groups in the community. Although knowledge about the biologic effects of ionizing radiation probably surpasses that of almost all other environmental factors in health and disease, there is an immense gap of public distrust regarding the uses and risks of radiation. Physicians and the professional groups of which they are members should help society bridge this gap.

Recommendations

The Council on Scientific Affairs recommends adoption of the following policy statement:

1. Many activities of society giving rise to LLRWs are useful; such activities include diagnosis and treatment of disease, research in science and medicine, and industrial uses such as generating electricity, detecting metal fatigue, and discovering oil.

2. The rules and recommendations for radiation protection promulgated by the NRC, the EPA, the National Council on Radiation Protection and Measurements, and the International Commission on Radiological Protection ensure that the framework is in place to build and operate facilities for LLRWs in a manner that protects the safety of workers and the public.

3. Physicians should inform their patients and help inform the public about the many beneficial uses of radioactive materials and about the measures and standards that are in place to reduce unnecessary exposures to these materials.

4. Physicians should minimize the diagnostic and therapeutic exposures of patients to radiation in accord with good medical practice.

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Editorial

Guest Editorial

The Right to Die, As with Death Itself, Is a Private Matter

The case of Nancy Cruzan brings to our attention the difficult issue of the "right to die." This 25-year-old woman has been in a vegetative state for five years following an automobile accident. Her parents are petioning the Supreme Court to allow removal of the feeding tube which is sustaining her life.

Since the Karen Quinlin case of the 1970s, more and more patients and their families are asking that life-support measures — from high-technology breathing machines to basic food and water — be removed to permit a peaceful death for those whose prognosis is hopeless. Despite numerous individual court decisions, there remains much disagreement in our society over this issue.

How should these difficult decisions be made? Who should decide if a life is worth preserving? Is it the patient or the family, the doctor or the judge?

Let's start with an easy case: A mentally competent, alert patient has sustained an irreversible major illness or injury. His bodily functions have so deteriorated that any meaningful recovery is inconceivable. Meaningful recovery *to whom?* Meaningful recovery to *the patient*. He makes the choice. He can demand that all life-sustaining treatments cease. He can do so even if his family or physician object. The courts have upheld the choice of the mentally competent patient on many occasions.

A more difficult case is the mentally incompetent patient who is hopelessly ill. In this example, however, the patient had the foresight to draft a "Living Will" while in good health. This document written when he was fully competent, outlines his wishes in the event that he should be incapacitated. It gives specific instructions for this very situation. Ideally, the result is thus just like that of the competent patient described above: The patient is the final arbiter of his own life. The provisions of the Living Will prevail, even if in disagreement with family or doctor. Unfortunately, the ideal is not quite reality in Connecticut. There are certain exceptions and exclusions from the dictates of a Living Will. However, at least the principle of the patient's *right* to decide for his life is stressed.

Unfortunately, these two examples are uncommon. In the vast majority of cases where life-support choices are at issue, we have neither a mentally competent patient nor a Living Will to guide us. Like Nancy Cruzan, these are often the most heart-rending of cases, young accident victims with a potentially long life span ahead of them.

Obviously, someone must make the life-support choice for these patients. But who?

I believe the family should make the ultimate decision. And they must make it using the principle described above: They should make the choice as they believe the patient would choose if he could act for himself. Their own opinions about the value of life and their own personal suffering over their loved one's illness should not affect their judgement. Instead, the family must decide what they think *his* view of his own condition would be and then choose accordingly.

For most families, this is not an easy task. They need help. Therefore, I recommend that a meeting be held to aid the decision-making process. Such a meeting should include, in addition to the family, the patient's physician. The doctor most fully understands the patients condition and prognosis. But as he or she is so close to the case, other medical consultation should be present to be sure that the patient's prospects for recovery are fully understood by the family. Finally, an "ethicist" or clergy member specially trained in these situations should attend. His or her job is the critical one of helping the family distinguish its own wishes from those they believe the patient would have.

Such a meeting is not meant to be a tribunal. It should not render a verdict, a thumbs up or thumbs down. Its only functions are to ensure that the family's decision is based on a complete understanding of the medical facts, and that it represents — as best as can be determined —what the family believes the loved one would want for himself. The family's decision reached after this meeting should be final. The only justification for a judicial hearing would be disagreement about the family's sincerity or motives. Luckily, such a situation is extremely rare.

The removal of life support for a hopelessly ill loved one is undoubtedly the most difficult choice a family can make. But I believe that the family can best express what the patient would wish. To this end, the family must be assisted by others with expertise in these matters in a supportive and confidential setting. As with death itself, the decision should be made with dignity and in privacy.

Dickerman Hollister, Jr., M.D.

Greenwich

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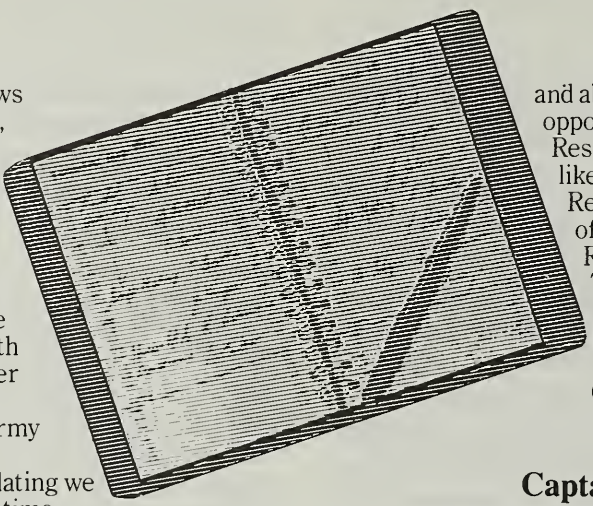

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AIR FORCE

Another Challenge

As part of its Health Care for All Campaign, the Connecticut Citizen's Action Group (CCAG) organized an all-day conference on 20 January 1990 which attracted about 250 people. Among the attendees were concerned citizens, activists, representatives of special interest groups, health care professionals, a few legislators, and a physician representing the Connecticut State Medical Society. The purpose was to discuss Connecticut's health care crisis and what to do about it.

"Paying More for Less" is the attention-grabbing title of a position paper distributed at the meeting. It is how CCAG describes our present health care system. The partial list of section titles from the paper reflects the agenda for the meeting. Problems: "Health Care Costs Are Out of Control," "Costs Are Bloated by Administrative Waste," "We Spend Billions on Unnecessary Procedures," "Millions of Americans Are Denied Coverage." Solutions: "Our System Needs Comprehensive Reform," "Canada's System Is Cheaper and Better Than Ours," "Incremental, Piecemeal Programs Won't Work," and "Connecticut Needs a Universal, Comprehensive, and Cost-Effective Unitary Program."

Prominent among the many speakers were United State Representative Bruce Morrison, also a candidate for the Democratic nomination for governor; John J. Sweeney, International President Service Employees Union ALF-CIO; and Jeffrey Scravron, M.D., president, Physicians for a National Health Plan. Each from his unique perspective endorsed a national health care program. The Canadian health system or some modification of it was the model most frequently endorsed.

Senator Cynthia Matthews, chair of the Blue Ribbon Commission on Health Insurance, reported on their activities. This representative 40-person commission has been holding a series of public hearings. Established by the legislature in 1989, the commission has been charged to recommend by March 1990 a comprehensive state health care program which is accessible to everyone, affordable, comprehensive in coverage, be administered by the state, and financed by a combination of state, employer, and beneficiary contributions. Senator Matthews warned the group that budget constraints might limit implementation of any proposed changes recommended by the commission.

It is quite obvious that many others are considering and discussing the future direction of health care. The legislature shortly will debate the recommendations of the Blue Ribbon Commission and, presumably, take some action. Shouldn't we be concerned, very concerned, about the decisions which are being made? Isn't it time the medical profession responded? It is an old political adage that "you can't beat something with nothing."

The American Medical Association is not unmindful of the desires of physicians and the urgency of the situation. An AMA proposal was presented by Donald T. Lewers, M.D., to a subcommittee of the United States House of Representatives in October 1989. In brief, the AMA proposed 1) that there be a phasing in of a requirement that employers provide health insurance within the private sector for all full-time employees, using tax credits where appropriate to soften the impact on small businesses; 2) that Medicaid be expanded to those who are unemployed and in poverty but with established national eligibility standards, national level of meaningful benefits, and adequate reimbursement for physicians and hospitals; and 3) that state risk pools be established to provide coverage for the medically uninsurable at reasonable premium levels.

I would urge each one of you to study the proposals, discuss your views with your patients, and lobby your legislators before the door closes in front of us. Not one of us wants National Health Insurance.

Roger S. Beck, M.D.
President

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Speculating with Nature

ROBERT U. MASSEY, M.D.

The debate over cholesterol, diet, and heart disease that heated up after the publication of "The Cholesterol Myth" in *The Atlantic Monthly* in September is another reminder that medical knowledge, like most things in this life, does not always carry the guaranteed certainty of a hard science. And physicists, the hardest of the hard scientists, are quite willing to admit that even their science gives them some trouble when reductionism reaches the level of quarks.

In medicine, quarks are hardly an issue, but molecular shape and charge are critical to our understanding of what happens on all those myriad surfaces on or in cells. Understanding at that level, however, does not often help to explain the relationship between eggs and heart attacks, or whether 65 year olds need to take notice. For the answers to questions like that, only Hippocratic, or perhaps Baconian, medicine will do: observe, record, count. The beginning of statistical medicine in the first half of the nineteenth century was truly the beginning of modern medicine, when we could begin to provide answers to questions about the efficacy of bleeding in erysipelas, or of handwashing for those attending on a delivery. Only after nature had been observed honestly and without prejudice was it possible to make up reasonable theories about how things happened and then test them in the laboratory. Once it was clear that Lister's methods made a difference in the incidence of postoperative wound infections, the next step was to look for the animalcules, or something like them, that simply had to be there. In Lister's words, "...if I were to put together the facts which I have had presented to me in surgical practice, proceeding on the antiseptic system, I should be able to present an array of evidence in favour of the Germ Theory as good and convincing as experiments performed in a laboratory."

Those clinicians who were so carefully observing and recording, measuring and counting, in those early nineteenth-century decades had caught the spring fever that Francis Bacon had hoped for more than 200 years earlier, a "secret initiation, which, like the coming of April or Spring, might avail to thaw and loosen your fixed and frozen minds." They were, to use another Baconian figure, putting Nature to the question.

But what *is* the question? At a lecture on the nature of memory some years ago in Hartford by the eminent neuroscientist, Sir John C. Eccles, a scientist in the audience approached him afterward with the comment, "Fascinating, Sir John, but you said nothing about *the* question!" For Eccles the important questions all had to do with the nature of consciousness, the human psyche, and the will. All his distinguished scientific work seems to have been informed, or drawn on, by this quest, and it was natural to have expected him to mention it. He had no hesitancy, however, in recognizing the allusion to *the* question.

Educators say we must look for promise in our students not by their ability to memorize but by their ability to solve problems. My dog does both very well, and after several million years of human evolution one might expect both critical qualities, remembering and problem solving, to be fairly well developed in our species as well. What seems to be unique to us is our remarkable ability, or the ability of some of us, to ask curious questions, some simple, some humorous, but some as profound as the cosmos itself. Asking questions has to do with wondering, and wondering flows from a sense of awe. For some whose materialism is less robust, awe may take on a numinous quality; there are examples throughout the literature of science.

How do we measure a sense of awe? I am convinced that those students who have it will be the brightest and best, and will become the finest doctors, the most splendid parents, the most inspiring teachers, and the best friends and citizens. But since we cannot measure awe and wonder, cannot even be sure about question-asking ability, that assertion remains unprovable. Perhaps it is better to leave this matter alone, not try to make a sense of wonder the subject of some standardized test. It is perhaps important that this quality should come only as a surprise, an inspiration, evoked by the game of hide-and-seek that Bacon saw mankind, to its glory, playing with nature and nature's God.

ROBERT U. MASSEY, M.D., Professor, Division of Humanistic Studies in Medicine, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington.

AROUND THE STATE

School Health Conference

The Connecticut Chapter of the American Academy of Pediatrics, through its committees on school health and adolescent health, will join with the University of Connecticut School of Medicine Department of Pediatrics, the Yale University School of Medicine Department of Pediatrics and the Yale University School of Nursing Pediatric Program to present a program on “Critical Issues in School Health,” Wednesday 21 March 1990. This is the twelfth annual School Health Conference, and will be held at the Treadway Hotel in Cromwell. The planning committee is **Paul Dworkin, M.D.; Leonard Krassner, M.D., M.PH; Carole Passarelli, R.N., M.S., CPNP; Nadine Schwab, R.N., PNP, M.PH; Martin W. Sklaire, M.D.; Elsa Stone, M.D.** For more information, call **Cecile J. Volpe,** Director, Office of Continuing Education, University of Connecticut Health Center, (203) 679-3340.

Female Athlete of the Year

Kris Karlson, A fourth-year medical student at the University of Connecticut School of Medicine is Connecticut’s Female Athlete of the Year for 1989. She was conferred the title by the Connecticut Sports Writers Alliance for her exploits as a world championship rower. Ms. Karlson won the lightweight single scull world championship for the second consecutive year in September in Yugoslavia. She won a second gold medal there in the lightweight double sculls, teaming up with a rower from Massachusetts. She and Jack Kelly, father of Princess Grace of Monaco, have been the only Americans ever to win two golds at the championships in the same year.

Medical Expo 1990

The Hartford County Medical Association will sponsor the fifth annual MEDICAL EXPO 1990 at the Hartford Civic Center on 25 and 26 April. This year’s anniversary celebration will feature over 270 exhibitors displaying products and services for health care professionals. A special feature of MEDICAL EXPO 1990 will be extensive recruitment by hospitals and health care facilities from throughout New England. Admission is free.

As the new decade unfolds, it will undoubtly bring vast changes and transformations in the provision of medical care. The symposium program, HEALTH CARE TOMORROW: CRITICAL ISSUES, CRITICAL CHOICES, promises to offer informative speakers and relevant topics pertaining to health care system reform and the rationing of care. Special programs for nurses as well as for long-term care facilities will also be featured.

MEDICAL EXPO will run Wednesday 25 April, 12:00 - 8:00 PM and Thursday 26 April from 10:00 AM -5:00 PM at the Hartford Civic Center. For more information, call Susan Macaione, Director of Communications and Community Relations, 525-2108.

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Whose Embryo Is It?

JOSEPH M. HEALEY, J.D.

THE increased availability of *in vitro* fertilization as a reproductive alternative and the increasing use of frozen embryos as part of the IVF process have focussed attention upon a series of controversial issues. Among the most prominent are the legal status of the frozen embryo and the manner in which disputes involving the custody and use of such embryos are resolved. A recent Tennessee case[1] was the first to examine these issues in any significant way. The decision has been strongly criticized by two of the leading experts in this area of health law.[2] Though the decision is expected to have limited value as a precedent, it nonetheless offers us the opportunity to explore the options facing a state like Connecticut attempting to deal with these unavoidable issues.

Junior Davis, a 30-year-old electrician, and Mary Sue Davis, a 28-year-old employee of Sea Ray Boat Company, had been married for a period of approximately nine years. They were eager to start their own family, but encountered a series of obstacles. Ms. Davis suffered five tubal pregnancies. After undergoing tubal surgery, Ms. Davis underwent six unsuccessful attempts to produce a child through *in vitro* fertilization. Attempts to adopt a child were also unsuccessful. Finally, the couple entered a new cryopreservation program. On December 8, 1988, nine ova were aspirated from Ms. Davis and fertilized with Mr. Davis' sperm, resulting ultimately in nine embryos at the four-cell stage. Two of the embryos were implanted, but pregnancy did not result. The remaining seven embryos were frozen and placed in cryogenic storage, to be implanted in the future. In early 1989, when Mr. and Ms. Davis decided to divorce, the issue of what to do with the frozen embryos was raised. Mr. Davis, the plaintiff in the lawsuit, asked the Court to do one of three things: (1) give joint custody to Mr. and Ms. Davis, (2) prohibit Ms. Davis or anyone else from using the embryos for implantation until he can decide about their disposition, or (3) as a last resort, allow their implantation only in Ms. Davis. Mr. Davis generally opposed destruction of the embryos, but preferred their destruction to their implantation in anyone except Ms. Davis.

Judge Young, the trial court Judge, held that the temporary custody of the seven cryopreserved human embryos would be vested in Ms. Davis for implantation. He reserved all issues surrounding support, visitation, final custody, and related issues for consideration and disposition should one or more of the seven embryos be born live. His judgment was based on twelve "salient" findings and conclusions:[1(p.1-2)]

(1) Mr. and Mrs. Davis undertook *in vitro* procedures for the purpose of producing a human being to be their child.

(2) The seven cryogenically preserved embryos are human embryos.

(3) American Fertility Society Guidelines are for intra-professional use, are not binding upon the Court, but are of probative value for consideration by the Court.

(4) The term "preembryo" is not an accepted term and serves as a false distinction between the developmental stages of a human embryo.

(5) From fertilization, the cells of a human embryo are differentiated, unique and specialized to the highest degree of distinction.

(6) Human embryos are not property.

(7) Human life begins at conception.

(8) Mr. and Mrs. Davis have produced human beings, *in vitro,* to be known as their child or children.

(9) For domestic relations purposes, no public policy prevents the continuing development of the common law as it applies to the seven human beings existing as embryos, *in vitro* in this domestic relations case.

(10) The common law doctrine of *parens patriae* controls children, *in vitro*.

(11) It is to the manifest best interests of the child or children, *in vitro,* that they be available for implantation.

(12) It serves the best interests of the child or children, *in vitro*, for their Mother, Mrs. Davis, to be permitted the opportunity to bring them to term through implantation.

Discussion of this case will continue in next month's column.

REFERENCES

1. *Davis v. Davis v. King.* Fifth Jud. Ct., Tennessee, E-14496, September 21, 1989 (Young, J).
2. See John Robertson, "Resolving Disputes over the Disposition of Frozen Embryos," and George Annas, "A French Homunculus in a Tennessee Court," *The Hastings Center Report,* Volume 19, No. 6 (November/December 1989), pp. 7-12 and 20-22.

JOSEPH M. HEALEY, J.D., Associate Professor, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington, CT.

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50 Years Ago
From the *Journal of the Connecticut State Medical Society*
February 1940

REPORT ON TUBERCULIN TESTS IN MIDDLETOWN

M. L. Palmieri, M.D., M.P.H., Middletown, Conn.*

During November 254 adolescent boys and girls were tested with Tuberculin (P.P.D.). Three groups were included in the total number. They consisted of the second year pupils in Woodrow Wilson High School, Middletown High School and the local National Youth Administration employees. Tabulation of individuals who underwent the test is as follows:

NYA	WHS	MHS	TOTAL
47	59	142	254

The number of positive reactors and percentage of positives in each group are tabulated as follows:

NYA	WHS	MHS	TOTAL	
19	7	37	63	Total number
40	12	26	25	% of total

The range of age in the combined groups is 14 to 26 years and the average age for each individual group is as follows:

NYA	WHS	MHS
20	15	15

Middletown High School serves the area known as the First Taxing District, which is a rather densely populated section of the city. Wilson High School draws its students from the Second Taxing District, which is that territory surrounding the periphery of the First and is less densely populated.

Although the average age of the pupils in the two high schools is the same, the chief factor which causes a greater percentage of positive reactors in the MHS group is probably attributable to the more crowded conditions under which the latter group lives. The NYA has one factor in common with the MHS group and that is that the bulk of the group live in the First Taxing District. It is also an older age group and the fact that they are employed on NYA shows that most of them are from families in the low income bracket in which the standard of living is not of the best.

The group received x-ray studies of the chest thus:

NYA — 15 of 19 pos.
WHS — 5 of 7 pos.
MHS — 27 of 37 pos.
TOTAL — 47

In all subjects except two, x-ray revealed healed tuberculous infection of the childhood type with calcification either of tuberculous lymph nodes at the root of the lungs or in the lung tissue or both. Two students showed suspicious lesions and they are being investigated further. The public health nurses will visit the home of positive reactors and urge other family members to have check-up examinations with their family physicians.

You can't treat tuberculosis until you find it.

IN MEMORIAM

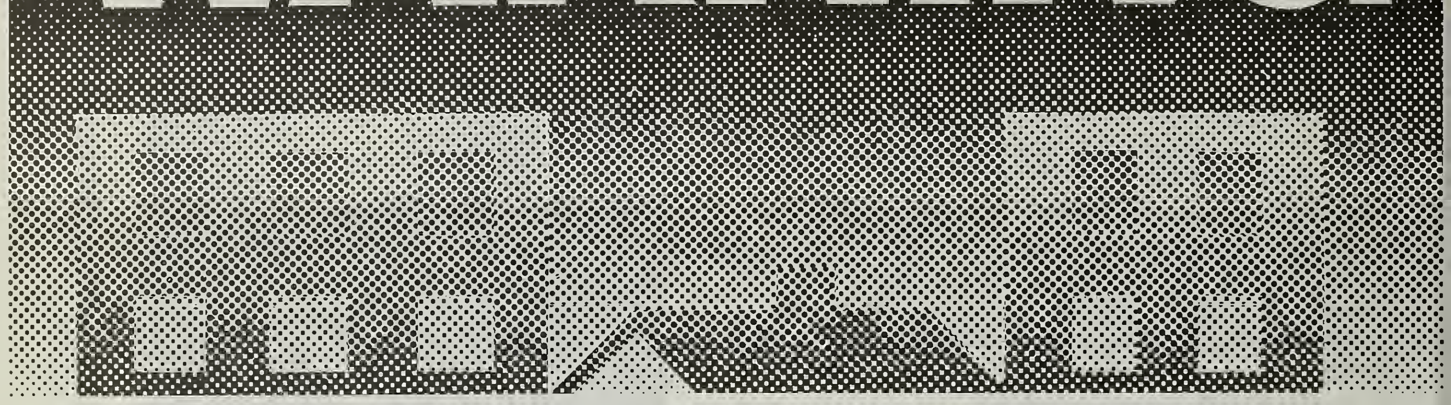
Raymond T. Sullivan, Jr.
1928 -1990

Raymond T. Sullivan, Jr., 61, of Middlefield, the Connecticut State Medical Society Director of Public Affairs for the past five years, succumbed to an apparent heart attack on 23 January 1990, while jogging in Wallingford. He was the husband of Nancy Y. Sullivan.

His was a long career as a medical society executive, working as an AMA representative, as Executive Director of county associations in Ohio and Nevada, and most recently at CSMS. Mr. Sullivan had also served for ten years in the United States Navy, for 17 years in the Coast Guard Reserve, and most recently, as a Connecticut State Police Supernumerary.

Ray was known to many physicians, coaches, and trainers through his able service to the CSMS Committee on Sports Medicine, to the annual CSMS Sports Medicine Symposia, and the CSMS publication, *Connecticut SportsMed.* Among other assignments, he was responsible for the *CSMS Action* newsletter, the new CSMS Pictorial Directory, CSMS public service announcements and media relations, and the CSMS/CHIS Physicians' Buying Service. Ray also helped the Society's political action arm, COMPAC, during the period of its most remarkable and substantial growth, attributable to his vision, energy, and diligence.

The Connecticut State Medical Society, and its physicians and staff alike, have lost a dedicated and loyal advocate and friend.



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From the Executive Director's Office

COUNCIL MINUTES

Wednesday, January 10, 1990

Attendance

Present in addition to the Chairman, Dr. Joseph C. Czarsty were Drs. Ahamed, Beck, Blum, Brooks, Chmielewski, Dardick, Eslami, Freedman, Hollister, Kaufmann, McDonnell, Orphanos, Petrie, Petro, Redmond, Reyelt, Jr., Rose, Sosa, Zanker, and Zlotsky.

Also present: Mr. Norbeck, Mrs. Lindquist, Mr. Brunell, Mr. Sullivan, Ms. Ballou, Mr. Tomat (FCMA), Mr. Coffey (HCMA), Mr. Freberg (NHCMA), and Mrs. David Reed (President, Auxiliary).

Absent were: Drs. Bobruff, Bonner, Fox, Franklin, Kamens, Keating, Lesnik, Meridy, Parikh, Robbins, Sadowski, Welch, Wetstone, and Zeppieri.

Alternate Delegate to AMA

Dr. Czarsty introduced Neil H. Brooks, M.D., Rockville, who attended his first Council meeting as a new member of the AMA delegation.

Reports on Related Organizations

Dr. Kamens submitted a written report that CPRO has recently received a three year renewal of its contract with Health Care Finance Administration (HCFA). The report stated that the regional office informed him that CPRO is held in high regard by HCFA, and that this would not have been possible without the leadership of CSMS in establishing the PRO and giving it guidance and the cooperation of countless physicians in the state who review, attend committee meetings, serve on the board and provide input.

Report of the President

McKinney Scholarship Fund: Dr. Beck reported that the Foundation is a coalition of medical and business associations with the purpose of supporting, among other projects, the education of health care professionals who plan to work with patients with AIDS. CSMS along with the Hartford County Medical Association, the Connecticut Nurses' Association, the Insurance Association of Connecticut and the Hartford County Bar Association have been invited to be sponsors, and CSMS has become a sponsor. At the present time the coalition is looking at awarding a nursing scholarship to a male aide at the state's prison, who has been working with individuals at the prison with AIDS.

AARP Meeting: Dr. Beck reported on a meeting that he, Joseph Czarsty, M.D., Tim Norbeck and Kyle Ballou had with five members of AARP representing the AARP legislative committee. There were three main issues which they wished to discuss: (1) Strengthening the language in the power of attorney for health care decisions, i.e. "Living Will," and additional meetings are to be held to clarify the language in this document. (2) Increasing the effectiveness of the Connecticut Medical Licensing Board: The AARP representatives claimed that there was inadequate communication between the Licensing Board and CPRO regarding complaints received, and further study will be made of this issue. (3) Mandatory Assignment: On this subject, no agreement could be reached and it was stated that CSMS could not support mandatory assignment. The meeting proved to be very worthwhile and future meetings are anticipated.

Legislation: In the absence of Dr. Wetstone, Dr. Beck reported on the activities of the Legislative Committee. Some of the issues being studied or acted on by the committee are:

(1) *Tort Reform:* The committee has requested CSMS staff to research viable reform alternatives for the 1991 General Assembly and also to include model Medical Liability and Patient Protection Act in the scope of that research.

(2) *Exemption Regulations for Physicians Laboratories:* Meetings have been held with representatives of family physicians, internists and pathologists in an effort to write rules and regulations for laboratories in physicians' offices. At the present time the rules are very restrictive and almost impossible to comply with. In the minutes of the Committee on Legislation, the Council is being asked to take an action regarding this subject.

(3) *Lyme Disease:* The committee agreed to support the concept of low cost or free testing for Lyme Disease only when medically appropriate, and only if the patient is indigent in which case the state should undertake the cost.

(4) *Resident's Hours:* The committee has been meeting with various representatives of teaching hospitals to try to resolve this issue.

Dr. Beck reported that it has come to his attention that the Chairman of the General Assembly's Labor Committee has suggested that a fee schedule be established for medical treatments to get a better handle on medical costs. This is another issue that will be discussed with the Workers' Compensation Commissioner and a meeting has been set up with representatives of CSMS and CBIA.

Report of Executive Director

Tim Norbeck reported on the following items:

(1) *Pepper Commission:* This is a fifteen member commission established by Congress to prepare "First Comprehensive Public Policy on Health and Long Term Care." Senator Jay Rockefeller chairs it and twelve prestigious members of the House and Senate are on the commission, which assures that Congress will give the report, due March 1, more than mere lip service. One of the recommendations will be mandated insurance coverage and will require all business to provide health insurance for workers or pay a penalty. He reported that with the repeal of the catastrophic insurance and the deficit, many observers feel nothing will happen in 1990, but the Senate may push hard on the uninsured issue.

(2) *Health Care Costs:* The U.S. Department of Commerce is due to issue its yearly report on the U.S. economy later this month and the report will predict that the U.S. health bill will increase 10.4% from 600 billion in 1989 to 661 billion. The report will state that

rising health care costs, the uninsured and long term care are such serious problems that the restructuring of the U.S. health system is inevitable. The report states that physicians' services will increase 15% in 1990 over 1989. "Physicians are the primary motivating factor behind increased health expenditures" concludes the report without detailing reasons. On the other hand, in predicting that hospital costs will escalate by 9.5% in 1990 over 1989, the report lists a number of reasons, such as increased nurses' salaries, technology and "providers of care who want to recoup past losses." Mr. Norbeck informed the Council that a response will be made to the report when it is made public.

It was voted to request the Committee on Legislation to study the AMA policy on insurance coverage for the uninsured and establish a position for CSMS.

Report Of The Auxiliary

Mrs. Joan Reed, President, reported that the Auxiliary is in dire straits and thought has been given to disbanding the group. Only two of the smaller counties have any planned projects, and enough interest cannot be generated in the other counties to retain or restart county auxiliaries. The Board has been working on statewide programs but is has been difficult to get members to attend any functions. The Board has decided to remain as a shell organization and will try to keep in touch with all of the spouses of CSMS to give them information about activities and projects of the Auxiliary in Connecticut and on the national level. Mrs. Reed also discussed the possibility of co-sponsoring a seminar on "Medical Marriages and/or Families" for physicians and their spouses. Feelers are being put out to ascertain whether there is any interest in such an undertaking and will be reported on at a later date. Following discussion, the Chairman of the Council requested that the Council members give some thought to ways to promote the Auxiliary and to the suggestion that members of the Auxiliary be added to various CSMS committees. It was further requested that the subject be placed on the agenda of the next Council Meeting.

Report on 1989 Interim Meeting of AMA House of Delegates

Two reports on the 1989 Interim Meeting of the House of Delegates were distributed to the members of the Council, one prepared by the AMA and the other by Stewart J. Petrie, M.D., Chairman of the Connecticut Delegation. Various members of the delegation commented on the meeting and the main issues covered were AIDS, the subject of Privacy between physician and patient, Expenditure Target's (ET's), the use of "parameters" and those of Medicare Volume Performance Standards, Drunk Driving, PROs, and many other issues.

Ad Hoc Committee on Physicians' Assistants

It was VOTED to receive a report from Stephen O'Brien, M.D., the CSMS representative on the Ad Hoc Committee, as information. The report included a discussion of the regulations being promulgated concerning prescriptive authority and scope of practice.

Nurse Practice Prescriptive Authority Legislation

Neil Brooks, M.D., CSMS representative on the Advance Practice Registered Nurses' Regulatory Program, reported that the legislation went into effect on January 1 without regulations for those areas in which nurses are given authority to prescribe within the bill. The committee's charge is to look at other areas where nurses could prescribe. One of the problems being confronted is the difference between the general nurses who want prescriptive authority and the certified nurse anesthetist. The nurses would like one set of regulations which does not appear to be possible. He also reported that resolving all of the problems would not be an easy task and that it would be several months before any decisions would be forthcoming. Dr. Beck commended Dr. Brooks for undertaking this difficult assignment.

Connecticut Health Institutional Services, Inc. (CHIS)

Richard Altman and Jeffrey Fromme, representatives of CHIS, joined the Council to discuss CSMS member participation in the CHIS program. They distributed to members of the Council a report on income and expenses of the program from its inception, a blind tabulation of leadership participation and a list of products and services available. Discussion was entered into concerning the various prices of the products and the representatives requested that they be advised when prices of the CHIS vendors were not competitive.

Life Members

It was VOTED to receive as information the names of the following physicians who have been granted Life Membership:

Elizabeth B. Birge, M.D., Stratford (F)
Herbert G. Cohen, M.D., Danbury (F)
Sung J. Liao, M.D., Middlebury (NH)
Richard Wexler, M.D., Westport (F)

Minutes of Meetings

It was VOTED to receive the following minutes as information: Liaison Committee with Department of Income Maintenance 11/21/89 Committee to Study Perinatal Morbidity and Mortality 12/11/89.

Committee on Legislation 11/15/89—VOTED to receive as information and approve a request of the committee that CSMS oppose or work to modify proposed exemption regulations for physicians' laboratories.

Preadmission Certification

Dr. Redmond raised the issue of third party payors seeking information on patients for hospital preadmission certification and what guidelines should be followed in divulging the facts of a case to these entities. Following discussion, the Chairman of the Council informed the Council that some research would be made into the subject and reported on at the next Council meeting.

Dates of Future Council Meetings

Thursday, February 22, 1990
Wednesday, April 4, 1990

N.B.: *The foregoing is a summary of the proceedings and actions of the Council on January 10, 1990. Detailed minutes of the meetings are on file at 160 St. Ronan Street, New Haven, for purusal by any interest member of the Society.*

CSMS PHYSICIAN PLACEMENT SERVICE

The Society maintains the Physician Placement Service as a free service to the medical profession in Connecticut. Opportunities for physicians to locate in Connecticut will be published as space permits and will be distributed to physicians making inquiries of such opportunities. Information should be sent to 160 St. Ronan St., New Haven, CT 06511 (203-865-0587).

Physicians wishing to establish practice in Connecticut are invited to submit a resume to be kept on file with the Society. An announcement of a physician's availability will be published in two issues of *Connecticut Medicine* as space permits.

Listing of physicians in the Placement Service does not in any way represent certification by the Society. Investigation of credentials and experience is the responsibility of those seeking applicants for positions.

OPPORTUNITIES FOR PRACTICE

AMBULATORY CARE

Ambulatory care facility seeks licensed physician with malpractice insurance for two to three Saturdays per month. 9:00 A.M. to 5:00 P.M. Please call 934-4357.

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Urgent visit physicians. CHCP, a pre-paid Staff Model HMO in its eighteenth year of service with over 68,000 members is seeking Urgent Visit/E.R. physicians for positions currently available and for positions which will start within the next year. Affiliations with prestigious institutions such as Yale New Haven Hospital enable our staff to provide high quality medical care while offering opportunities to maintain clinical skills in the setting of an established HMO. Highly competitive compensation package. Send CV along with salary requirements in confidence to: Charles Hollander, M.D., Medical Director, Community Health Care Plan, Inc., 150 Sargent Dr., New Haven, CT 06511. (203) 781-4100, Fax (203) 562-2802. We are an equal opportunity employer.

FAMILY PRACTICE/INTERNAL MEDICINE

Family practice partnership looking for family practitioner, resident or internal medicine resident with general medical experience to do locum tenens work for summer 1990 in Old Saybrook. Very flexible hours can be arranged. Call Susanna Thomas, M.D., 453-8703 or 388-1495.

INTERNAL MEDICINE

Cardiology: BC/BE Cardiologist wanted to join multi-specialty internal medicine group, replacing a retiring cardiologist. Must be board certified in Internal Medicine and eligible or certified in cardiology. Must be a US grad. Terrific opportunity for teaching of House Staff in Yale affiliated residency program, CCU care, critical care, and non-invasive cardiology. No cath. Salary, benefits, and opportunity for partnership. Send CV to The Greenwich Medical Group, 49 Lake Avenue, Greenwich, CT 06830. (February 1990)

Physician for group IM Practice/Walk-in-Treatment Center in Farmington Valley (Connecticut). Experienced. Board certified in IM; FP; or EM. Competitive salary and benefits. Full time. Send CV to Box 555, Canton, CT 06019.

For sale or lease or share: fully equipped medical office; central location; 20 miles north of New Haven. Ideal for satellite office for one or two doctors. Low rent. Physician retiring. Write, CSMS, c/o IM/NV.

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MISCELLANEOUS

Free-basis, part-time, physicians needed to assist in physical examinations at the New Haven Military Entrance Processing Station. Ideal for retired family practitioners, internists and pediatricians. MD's or DO's must be licensed in a state or territory of the United States, DC or PR. No malpractice insurance needed. $125.00 to $150.00 for short morning. Call Dr. Gerhard Mack (203) 787-3823 or write: Commander, New Haven MEPS, 150 Court St., 4th floor, New Haven, CT 06510-2056.

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PATHOLOGY

Pathologist needed. Board certified, A.P.; part-time; occasional locum tenens; Fairfield county. Send CV to CSMS, c/o PATH/SS.

PEDIATRICS

Neonatologist: Seeking an additional BE/BC Neonatologist for established Level II NICU in Central Connecticut. Active affiliation with UConn Regional Perinatal Network. Position includes clinical and teaching responsibilities, developmental follow-up and opportunity for clinical research. Send CV to: A.M. Capriglione, M.D., New Britain General Hospital, 100 Grand St., New Britain, CT 06050.

Full or part time associate to join four person pediatric group in a New Haven suburb located five miles from Yale-New Haven Medical Center. Earnings will be 55% of gross income. Call 248-4846 any evening after 7:00 P.M.

PHYSICIANS WISHING TO PRACTICE IN THE STATE OF CONNECTICUT

GENERAL SURGERY

Oct. '90. Age 37. Licensed in Connecticut. Presently in practice. FLEX. AB cert. MD, University of Juarez, Chichauahua, Mexico; Int. and Res., New Rochelle, NY. Prefers medium-sized community. Write, Porfirio J. Rodriguez, M.D., 147 Mississippi, Dyess A.F.B., Texas 79607-1011.

July '90. Age 33. Presently in practice. Nat'l bds. AB elig. MD, Howard University, Washington, DC; Int., DC General Hospital, Washington, DC; Res., University of Medicine & Dentistry, Newark, NJ. Prefers group or associate type practice in a medium to large-sized community. Write, CSMS, c/o VL/GS.

INTERNAL MEDICINE

March '90. Age 36. Nat'l bds. AB cert. MD, Albert Einstein College, Bronx, NY; Int. and Res., Morristown Memorial Hospital, Morristown, NJ. Prefers any type of practice especially group and ambulatory care. Write, Mark Tieman, M.D., 6 Gilbert Lane, Plainview, NY 11803.

May '90. Age 42. Presently in practice. Nat'l bds. AB cert. MD, Tufts Medical School, Boston, MA; Int. and Res., the Hospital of St. Raphael, New Haven, CT. Prefers group or associate type practice. Write, Michael F. Collins, M.D., 8259 Toll House Rd., Annandale, VA 22003.

INTERNAL MEDICINE/PEDIATRICS

Aug. '90. Age 31. Nat'l bds, AB elig. MD, The Chicago Medical School, North Chicago, IL; Int. and Res., Bridgeport Hospital, Bridgeport, CT. Prefers group or associate type practice. Write, Eldad S. Ben-Menachem, 460 Amsterdam Ave., Bridgeport, CT 06606.

NEUROLOGY

Jul '90. Age 31. Licensed in Connecticut. Nat'l bds. AB elig. MD, University of East, Quezon City, Philippines. Int., University of Medicine and Dentistry of New Jersey, Newark, NJ (IM); Res., Nassau County Medical Center, East Meadow, NY (NEUR); Fellowship, Nassau County Medical Center, East Meadow, NY (Electrophysiology). Prefers group or institutional type practice. Write, Victor E. Ylagan, M.D., 299 Carman Ave., Apt. 12-C, East Meadow, NY 11554.

ORTHOPEDIC SURGERY

Jan. '90. Age 53. Presently in practice. Nat'l bds. AB cert. MD, Medical Academy, Wroclaw, Poland; Int. and Res., The Wellesly Hospital, Toronto, Canada; Fellowship, Montreal General Hospital, Montreal, Canada. Prefers solo or group type practice in a medium to large-sized community. Write, Andrew Tumiel, M.D., 27 Queen Anne Rd., Etobicoke, Ontario, Canada M8X 1T1.

PEDIATRICS

Sept. '90. Age 40. FLEX. AB elig. D.O., University of Osteopathic Medicine and Health Science, Des Moines, IA; Res., Pennsylvania State University/Hershey Medical Center, Hershey, PA. Prefers group or associate type practice in a small size community. Write, Christine B. Wilson, D.O., 123 Townhouse - Briarcrest Gardens, Hershey, PA 17033.

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Lithium

RIF S. EL-MALLAKH, M.D.

ABSTRACT—Lithium utility and toxicity are reviewed. Lithium continues to be the most useful agent available for the prophylaxis and treatment of bipolar illness. Lithium augmentation of antidepressants is useful in treatment-resistant unipolar depression. Utility in other psychiatric disorders, such as schizoaffective, alcoholism, or aggressive behavior, is documented only when a significant affective component coexists. In internal medicine, lithium has proven useful in the prophylaxis of cluster headaches and in ameliorating chemotherapy-induced neutropenia. Other miscellaneous uses in both psychiatry and medicine have been anecdotally reported and are reviewed. However, the use of lithium may be limited by acute and chronic toxic side effects. Acute toxicity almost always manifests as central nervous system (CNS) dysfunction, and the degree of toxicity usually parallels the extent of CNS dysfunction. Chronic toxic manifestations effect cardiac, renal, and endocrine systems. *In fetu* exposure may be teratogenic.

THE medicinal use of lithium (Li) salts in the United States began soon after the element was discovered in 1817.[1] Mid-nineteenth century physicians used Li salts to disolve uric acid crystals in gout,[1,2] and also believed Li bromide to be a sedative and anticonvulsant.[2] In the 1940s American cardiologists recommended using Li chloride as a sodium chloride substitute on food. However, the combination of excessive, uncontrolled Li consumption, sodium (Na) restriction, and diuretic-induced Na depletion in these cardiac patients resulted in a multitude of Li toxicity-related deaths.[3,4] This experience produced a lasting discomfort among American physicians regarding Li use.

In 1949, shortly after noting the marked sedating effects of acute Li administration in hamsters, Cade reported on his success in treating severely manic patients.[5] More extensive work in Europe led to the confirmation of the antimanic effects of Li,[6,7] and its general acceptance as a first line mode of treatment. The American experience with Li in the 1940s, coupled with the poor market potential of a simple, nonpatentable element, delayed Food and Drug Administration (FDA) approval until 1970.[1] American physicians' caution with Li persists. This is reflected by the fact that Li is the only psychotropic agent which is prescribed most frequently by psychiatrists as opposed to primary care practioners.[8]

Clinical experience over the past 20 years expanded both our knowledge and use of Li. This review updates the current status of Li use. The first section reviews therapeutic uses of Li. The second section reviews acute and chronic toxic effects of Li use. The last section provides a brief guide for monitoring for potential side effects.

Li Pharmacology

In the United States Li is available as a dibasic carbonate salt in both regular and slow release tablets and capsules. Li is also available in a liquid as a citrate salt. Generally, dosages vary from 150 mg (4.06 mEq) to over 2 g (56.84 mEq) daily, depending on renal function. Lithium is excreted primarily by the kidney with trace amounts being lost in the saliva, sweat, and gut. Lithium has a long half-life (range 8-32 hours, mean 20-26 hours[9,11]). Because of this, and also because of differential rates of transmembrane Li transport,[12] it takes six to 10 days for Li to reach steady state.[13,14] Theoretically, the entire daily dose can be given at one time. However, Li is rapidly absorbed from the gut after an oral dose[15] and reaches peak serum levels within three hours.[2] This rapid rise in serum Li produces signs and symptoms of mild toxicity[8,16] and consequently single, large doses of Li are poorly tolerated. Li is best administered in two to three daily doses with meals.

Li has a narrow therapeutic index. Generally, therapeutic serum Li levels are held to be between 0.5 and 1.2 mEq/L and levels above 1.5 mEq/L are considered to be in the toxic range.[4] Individual variation makes these numbers general guidelines only.

Several studies have recommended methods that predict Li dosages which will achieve steady state therapeutic levels.[17-19] Most of these protocols advocate the measurement of a single Li level 24 hours following the administration of a 600 mg test dose.[17-19] Although these studies report a high degree of accuracy in predicting

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dosage requirements, there are several reasons for following a more conservative approach. Most frequently, acute Li toxicity occurs in the first two weeks following initiation of therapy or increase of dosage.[4] This is explained by the observation that calculated Li half-lives lengthen as steady state is approached.[11] Furthermore, since acutely manic patients retain sodium [20-22] which delays the intracellular accumulation of Li, [12,13,23] there has been an accurate, but clinically inappropriate, assumption that acutely manic patients require a higher dosage of Li. Finally, although Li is the agent of choice in prophylaxis of recurrent affective illness (see below), it is inferior or equal to neuroleptics and electroconvulsive therapy (ECT) in the acute setting.[24,25] All of these findings suggest that caution in an acutely ill patient is to be preferred to aggressive treatment with Li.

Li in Psychiatry

Bipolar Illness

The use of Li has become almost synonomous with treatment for bipolar illness, and its efficacy in both prophylaxis and treatment has been repeatedly confirmed. Following Cade's original descriptions,[5] several open or single-blind studies were published.[26-29] These studies reported improvement in manic symptoms in 70% to 80% of patients. Although there is an appropriate suspicion of open trials in psychiatry, subsequent placebo-controlled[6,30,31] and blinded neuroleptic comparison studies[32-36] have shown similar results. Li is clearly the most useful agent in preventing bipolar relapse,[36,37] but in the first few days of the treatment of the acutely manic patient, Li is equal or inferior to neuroleptics or ECT.[24,25] This becomes apparent when one remembers that it takes seven to 10 days for Li distribution to equilibrate among the body's fluid compartments,[13,14,38] and that it is the intracellular fraction that is responsible for the prophylactic and therapeutic effects.[12]

Despite the fact that Li is the most effective antimanic agent, 20% to 30% of bipolar patients are Li treatment failures, either because of inadequate response or inability to tolerate side effects.[39]

Unipolar Depression

Among unipolar depressives, the effectiveness of Li is not as impressive. Li alone, or in combination with a tricyclic antidepressant, provided no advantage over the antidepressant alone in randomly selected unipolar patients.[37] However, among antidepressant nonresponders, Li augmentation appears to provide a rapid and frequently impressive response.[40-42] Likewise, Li augmentation of combined neuroleptic-tricyclic treatment in delusional depression[43] may be an alternative to ECT (the treatment of choice in difficult delusional depression).[44] The mechanism by which Li augments antidepressants remains unknown.

Schizoaffective Illness

Despite persistant attempts, differentiation between bipolar illnesss and schizophrenia is not always possible. Many believe that the diagnoses overlap or the illnesses frequently coexist. A diagnostic category of schizoaffective illness is frequently used when symptoms of thought disorder occur simultaneously with affective symptoms or severe psychomotor excitement.[45] Although the validity of this diagnostic category is frequently questioned,[46] drug trials in this group have, nonetheless, been attempted. Li appears to be effective in patients classified as schizoaffective. Of 113 patients reported in 19 papers published between 1951 and 1980 (including anecdotal, controlled, and uncontrolled studies), 82% show a favorable response.[47] A number of the controlled trials suffer from methodological deficiencies that make any conclusion suspect[47] (eg, in a study comparing chlorpromazine to Li, many of the "Li failures" were toxic with levels ranging from 1.0-2.55 mEq/L).[48] Nonetheless, when these studies are reviewed critically, it appears that a significant fraction of schizoaffective patients, 40% among controlled studies and 75% overall (excluding anecdotal reports), show a significant favorable response to Li.[47]

Schizophrenia

Numerous controlled and uncontrolled studies of the usefulness of Li in schizophrenia have been conducted. Taken together these studies do not indicate sufficient benefit to warrant risking the side effects of Li.[49,50] However, a subgroup of patients diagnosed as schizophrenics, and exhibiting a generally stable level of interepisode functioning (occasionally labeled 'good prognosis schizophrenics') may benefit from Li therapy.[51,52] Some authors believe that these 'Li-responsive schizophrenics' may actually be affective disorder variants.[52]

Alcoholism

Affective illness has a high prevalence of comorbidity with alcoholism, although the rate of comorbidity may not be as high as originally believed.[54,55] This long recognized association prompted Kline and his associates[56] to test the efficacy of Li in preventing alcohol abuse relapse. Li significantly reduced both readmission rates and episodes of relapse when compared to placebo in depressed alcoholics.[56] More recently, another double-blind, placebo-controlled Li trial in nondepressed alcoholics revealed 67% abstinence rate among patients with therapeutic Li levels compared to less than 44% for noncompliant or poorly compliant patients.[57] Although these effects on abstinence were independent of any effect on mood or social withdrawal,[56,57] the project design in the latter study (ie, examining compliance with abstinence as a function of compliance with medication) prevents any useful conclusions. In the most recently published prospective double-blind, placebo-controlled study, there was no demonstrable effect of Li on abstinence even in depressed patients.[58]

Miscellaneous Psychiatric Conditions

In addition to these well-studied uses, Li has been recommended or tried in a variety of other psychiatric conditions.

In late luteal phase dysphoric disorder (premenstrual tension syndrome or PMS), where placebo response can be 40% to 50%,[59] open, uncontrolled trials show that Li is helpful,[59,60] but blind, placebo-controlled studies show no difference between placebo and Li.[61-63]

Li has also been recommended for use in aggressive or impulsive behaviors.[64-66] However, with the exception of aggression in Huntington's chorea,[65,66] most authors believe that Li is useful in this setting only when a significant affective component coexists.[67-70] Likewise, the experience in treating hyperactivity in children, [67-72] or organic mental states[70,73,74] has confirmed efficacy only when a significant affective (and generally manic or hypomanic) component exists.

Many of these studies have led some workers to the tentative conclusion that Li may be a 'disease-specific' agent. Although a significant fraction of the clinical psychiatric literature supports this, the far-reaching effects of Li preclude such a conclusion.

Li in Neurology

The only well-established indication for Li in neurology is for cluster headache prophylaxis.[75,76] The prophylactic effect in most patients is maintained with chronic treatment when Li is administered at affective disorder doses and serum levels.[75,76] This effect is limited to cluster headaches, and Li may actually exacerbate migraine headaches.[77]

Animal studies have shown that concomitant chronic Li treatment prevents development of chronic neuroleptic-induced dopamine receptor supersensitivity.[78,79] This finding suggests that Li may be of use in hyperkinetic disorders. However, early favorable anecdotal and open trials using Li to control abnormal movements in Huntington's chorea,[80,82] were not confirmed in double-blind studies.[65,83] Likewise, early open trials of Li in tardive dyskinesia that showed marked improvement in abnormal movements.[80,84-86] were not confirmed by double-blind studies.[87,88] However, initial anecdotal reports that Li may ameliorate the "on-off" levodopa syndrome of Parkinson's disease,[89] appear to have been confirmed in a small, blinded, controlled study.[90] Furthermore, as might be expected from the initial murine studies[78,79] patients who receive both Li *and* neuroleptics chronically may be partially protected from developing tardive dyskinesia.[91,92]

At toxic doses, Li is a convulsant, producing seizures in nearly a quarter of patients with severe (grade III) toxicity.[4] However, at therapeutic doses Li has been hypothesized to be an anticonvulsant.[12,22] Indeed, in safety studies in epileptic bipolar patients, Li has demonstrated a protective effect, showing a reduction in the seizure frequency.[93,94]

Li in Hematology

Psychiatrists noted early that their patients receiving Li exhibited a mild, innocuous leukocytosis.[95,96] The realizataion that this represented a real increase in the granulocyte pool[97,98] and that it persisted over the years of Li administration,[99] led to clinical trials. Anecdotal reports in idiopathic or heritable neutropenia have been variable.[100-103] However, when Li is administered during anticipated chemotherapy-induced nadir periods, there is a significant increase in granulocyte counts.[104,105] Although some studies questioned the significance of this effect,[106] most researchers found that Li treatment reduced infections, length of hospitalization, and antibiotic use.[107,108] Similarly, Li reverses azidothymidine-induced neutropenia in patients with acquired immunodeficiency syndrome,[109] but the significance of this finding remains to be assessed.

Likewise, some studies,[110-111] but not all,[107] have reported a beneficial effect on platelet counts in chemotherapy treated patients.

Psychiatrists occasionally make use of the granulocyte stimulating effect of Li to counter the leukopenic effect of carbamazepine while potentially boosting the antimanic actions.[112,113]

Miscellaneous Uses in Medicine

Li produces hypothyroidism in perhaps 3% of patients,[114] and elevated thyroid stimulating hormone (TSH) may occur in 10% to 20% of Li treated patients.[114-116] Consequently, Li was tried in hyperthyroidism and found to be marginally effective.[117]

Li also exerts an antidiabetic effect.[118-120] This action may be related to decreased intracellular calcium which antagonizes glucagon.[12,121] This effect is significant in diabetic patients being treated with Li and may necissitate reduction in dosage of insulin or hypoglycemic agent.

Finally, Li has been used or tried in a variety of other medical disorders. However, these uses are often anecdotal, contradictory, or show no efficacy, and include the syndrome of inappropriate antidiuretic hormone secretion, periodic paralysis, Meniere's disease, spasmodic torticollis, ulcerative collitis, and vitiligo.[1,122,123]

Li Toxicity

Despite its documented utility, the toxic potential of Li limits its use.[8] Acute Li toxicity almost always has central nervous system (CNS) manifestations and is usually accompanied by increased serum Li levels.[4] Chronic toxic side effects are seen in a multitude of other systems and occur at therapeutic Li levels. This section will consider acute neurotoxicity and chronic cardiac, renal, endocrine, and other toxic manifestations.

Acute Lithium Neurotoxicity

When acute Li toxcity occurs, 95% of patients present with neurologic signs and symptoms (Table 1). Early gastrointestinal upset, mild tremor, and weakness are signs of *increasing* Li levels.[124] These symptoms are not infrequently seen in the first few days of the initiation of Li therapy[4,124] and are generally most pronounced in the first few hours after an oral dose. However, when these

Table 1
Grades of Li toxicity[4,16]

Grade	*Sign or Symptom*
Pretoxic State	Fine tremor
	Nausea/vomiting
	Diarrhea
	Anorexia
	Weakness
Mild (Grade I)	Drowsiness and apathy
	Agitation or manic-like
	Hyperreflexia, hypertonia
	Muscle fasiculations
	Dysarthria
	Ataxia
Moderate (Grade II)	Impaired consciousness
	Coarse tremor
	Pronounced ataxia
	More severe fasiculations
	Myoclonus
	Paresis, paralysis
	Choreoathetoid movements
Severe (Grade III)	Coma or stupor
	Seizures (generalized, focal, or EEG)
	Muscle group twitching
	Spasticity
Resolution (Recovery)	Ataxia
	Dysarthria
	Hyper or hyporeflexia
	Nystagmus
	Tremor
	Spasticity
	Hypotonia

symptoms occur in a patient who has experienced them before, they should be considered prodromal to more severe toxicity (Table 1).[4,16] The most appropriate immediate measure would be to search for and treat precipitating factors, closely monitor Li levels, and possibly decrease the Li dose. Depending on the precipitant and general physiologic state of the patient, Li toxicity may progress over hours or a few days.[4,16]

Monitoring of serum Li levels is always recommended and is valuable; maximal serum Li levels are somewhat predictive of toxicity (Table 2). However, one needs to be aware of the limitations of serum Li values. Cases of severe Li toxicity at therapeutic serum levels,[4] and lack of toxic manifestations at otherwise fatal serum levels (as high as 4.5 mEq/L),[125] have both been reported. It is wisest to follow the clinical course and use Li levels as supportive data.

Table 2
Average of maximum reported serum Li levels and outcome of acute Li toxicity[4]

	Death	*Recovery with Sequelae*	*Total Recovery*
Maximum serum Li level (mEq/L)	4.24	3.26	2.54

Clinical monitoring is best done by following CNS status. The severity of Li toxicity is marked by progressive CNS impairment (Table 1). Cortical depression is manifest by apathy and drowsiness, which progress to lethargy and impaired consciousness, and ultimately to stupor, coma, and death (Table 1).[4] Upper motor neuron toxicity is manifest as hypertonia and hyperreflexia, progressing to muscle rigidity and myoclonus, and finally to spasticity (Table 1).[4] Cerebellar dysfunction is seen as progressively worsening ataxia, dysmetria, and dysarthria. The peripheral neuromuscular system exhibits tremor and fasciculations.[4] General loss of CNS homeostasis may produce various speech disturbances,[126,127] focal paresis or paralysis,[4] choreoathetoid movements,[128,129] transient cognitive deterioration,[130] or seizures.[4,130] Occasionally, mild Li toxicity may produce agitation or manic-like symptoms.[131] *Focal* Li toxicity may also occur. Li could cause isolated cerebral toxicity without cerebellar or neuromuscular involvement in a fraction of patients undergoing concurrent ECT.[132] In these cases, Li level increases intracellularly in the cerebrum secondary to the induced seizure. Serum Li levels do not increase and may actually fall.[132]

The recovery phase of acute toxicity is rarely discussed in the literature.[4] Generally, signs and symptoms gradually resolve over a few days. With recovery from more severe toxicity, the patient may progress through the same phases of toxicity in reverse. Consequently, there may be ataxia, dysarthria, dysmetria, hyperreflexia, spasticity, or hypotonia.[4] More rarely, seizures[130] or choreoathetoid movements[133] may also occur. Sequelae of toxicity may be long-lived or permanent. Of 78 cases of acute toxicity in which greater than one month follow-up is reported, 26 suffered some sequelae (Table 3).[4] Predictors of sequelae are severity toxicity (Table 2) and suboptimal or delayed treatment.[4]

Optimal treatment for acute toxicity is dictated by clinical course and serum Li levels.[4,16] In severe cases, hemodialysis is the treatment of choice.[4] Limited reports, mainly from Europe, have shown adequate results with peritoneal dialysis.[4] Less severe cases are usually supported until Li is eliminated by the kidneys. The use of sodium (Na) to provide an "internal dialysis," ie, to accelerate Li efflux from cells,[16] has not been adequately stressed in the literature. Sodium is important because the major route of efflux of intracellular Li is via the Na-Li counterexchange system.[12,134,135] Note that although this reduces the toxic intracellular Li, it may actually increase serum Li levels. This store of intracellular Li is also responsible for Li level rebound after a session of hemodialysis (ie, the increase in serum Li levels seen within the first few hours after hemodialysis).[136]

CNS manifestations can also occur as chronic side effects. Tremor and deep tendon reflex changes may persist in some patients. At therapeutic levels Li may also cause a subjective and objective decrease in cognitive functioning.[137,138] Although many studies are flawed by poor methodology or effects of the affective illness itself,[137] healthy volunteers on chronic therapeutic levels of Li exhibited a discrete reduction in ability to perform associative mental tasks.[138]

Table 3
The frequency of long-lived sequelae, in patients who experience sequelae, of acute Li toxicity (n=26)[4]

Sign	*Frequency*
Ataxia	50 %
Tremor	45.8%
Dysarthria	37.5%
Organic brain syndrome	25 %
Dysmetria	16.7%

Acute and Chronic Cardiotoxicity

Specific cardiac manifestations of acute Li toxicity are rare. Most reports of cardiovascular collapse describe terminal events in patients who presented with severe, late-stage neurotoxicity (coma and seizures).[139] However, several cases describing sinoatrial nodal blockade[140-144] frequently with dizziness, syncope, or exertional dyspnea, at therapeutic Li levels are clearly describing Li cardiotoxicity. Other noted Li cardiotoxic effects are an increased ventricular irritability with increased frequency of premature ventricular beats,[145,146] and decreased cardiac conduction with atrioventricular blockade, intraventricular conduction delays, and prolongation of the QT interval.[139,147-151] All of these changes have been reported to occur at both therapeutic and toxic Li level ranges.

These Li-induced conduction abnormalities resemble the antiarrhythmic effects of verapamil and diltiazem.[152-154] These primary cardiovascular agents delay conduction by interfering with calcium (Ca) transport across myocardial cell membranes.[152-154] Likewise, Li may act as a Ca entry inhibitor.[12] The mechanism of Ca entry blockade is probably different and Li is probably less effective at blocking Ca entry in myocardial tissues than the Ca channel blockers. Nonetheless, in the myocardium, the combined Ca entry blocking action of Li and the Ca channel blockers is probably additive, and acute cardiotoxicity with combined therapy has been reported.[155]

More chronic and less clinically significant cardiac response to Li therapy involves reversible, asymptomatic electrocardiographic (ECG) changes. Changes are limited to T-wave flattening, depression, and inversion, and resemble changes seen with hypokalemia. Li produces a relative intracellular hypokalemia.[12,139] Various authors have placed the incidence of these changes at anywhere between 20% and 100% of patients receiving Li.[139,149,156,158]

There are some reports of pathological changes in the myocardium of receiving Li; however, the etiological role of Li is questionable. Two cases of fatal myocarditis in patients receiving Li have attracted attention.[158,159] One patient had hypothyroidism, latent syphilis, and an undiagnosed generalized skin lesion,[158] and the other also suffered from hypothyroidism and preexisting cardiac failure.[159] Nonetheless, there are reasons to suspect that Li may play a role in producing myocarditis.[139] As stated earlier, Li produces a relative intracellular hypokalemia,[12,139] and severe potassium depletion and hypokalemia may produce a myocarditis in both animals and man.[137,160,161] Obviously, the rarity of this complication suggests that this may be a theoretical concern. Reports of myocardial infarctions in patients receiving Li[162-164] probably represent coexistance of separate and unrelated conditions. Li may actually be protective and in the trace amounts found in mineral-laden hard water, Li was associated with a decreased incidence of both sudden death and atherosclerotic heart disease.[165,166]

Finally, despite recognized arrhythmogenic effects of phenothiazines[167] and the high frequency with which they are coadministered with Li, there is a paucity of reported combined cardiotoxic manifestations.[168-170] These findings suggest that the cardiotoxic mechanisms of Li and phenothiazines, or neuroleptics in general, may not be additive.

Renal Toxicity

The most frequent renal side effects of Li treatment are polyuria and polysdispia.[171,172] Li produces an initial diuresis in as many as 50% of patients. This decreases to approximately 25% of patients on long-term treatment.[171,172] There are two causes for Li-induced polyuria. The first, a very mild and reversible polyuria, has to do with the large hydration radius of the Li ion;[15] i.e., when Li is excreted by the kidney a large number of water molecules accompanies it. The second, a more severe, vasopressin-unresponsive, but reversible impaired concentrating ability is nephrogenic diabetes insipidis (NDI).[173] NDI appears to result from Li's interference with vasopressin-activated cyclic adenosine monophosphate (cAMP).[173,174] Li decreases the kidney's sensitivity to both endogenously produced and exogenously administered vasopressin.[173] This effect is not sufficient to reverse fluid retention in the syndrome of inappropriate secretion of antidiuretic hormone.[175] Polyuria is generally not considered to be an omen of worsening renal function,[176] but this view has been disputed.[177,178] It is certain, however, that severe polyuria may reduce patient compliance, and may also pose a greater potential for Li toxicity if oral fluid intake is insufficient.[4,179] Consequently, several schemes to reduce polyuria have been described.

Since urinary Li excretion removes a large amount of body water, methods of retaining Li would decrease polyuria. Capitalizing on differential handling of Na and Li by the kidney, several workers have recommended thiazide diuretics.[173,180-184] Both Na and Li are readily reabsorbed by the proximal tubule; but, at normal Na levels, Li is not reabsorbed by the distal nephron.[180] Thiazide diuretics cause Na wasting by preventing Na reabsorption in the distal tubule. This increases both Na and Li retention by the proximal tubule. The decreased

Li clearance reduces the water loss and ameliorates the polyuria.[180] Since more Li is retained, significant reductions in Li doses are needed.[180,182,183] When using distal tubule diuretics, the maintenance of normal Na levels becomes of the utmost importance. Since the distal tubule will reabsorb Li in *hyponatremic* settings,[185] sudden Na loss may cause serum Li levels to rise. Nonetheless, various studies have shown that, with appropriate caution, Li and diuretics may be coadministered.[180-184] Still, the frequent presentation of acute Li toxicity soon after initiation of diuretic therapy[e.g,4,186] prevents widespread use of diuretics.

It is noteworthy that diuretics reduce water loss by reducing Li loss, but do not address the cAMP-vasopressin mechanism directly. Vasopressin response has not been investigated in either animal or human thiazide-treated Li polyuria.

In rare cases, severe polyuria may persist after discontinuation of Li.[187,188] Although thiazide diuretics may be useful in such cases,[187] the novel use of carbamazepine to treat both the manic behavior and NDI has been successful in at least one case.[188]

Glomerular function may also be affected by chronic Li treatment. Studies have suggested that there may be a slight decrease in glomerular filtration over time which for the majority of patients appears to be clinically unimportant.[178,189,190]

Much more serious have been the reports of histologically documented nephropathies.[176-178,191-196] In 1977, Hestbech et al[197] reported 14 patients who had suffered episodes of acute Li toxicity or had Li-induced NDI. They described interstitial fibrosis, tubular atrophy, and sclerotic glomeruli on biopsy and autopsy specimens.[197] Other similar reports were published through the late 1970s and early 1980s.[176,177,191-196] However, most of these reports did not include appropriate controls. When renal function of Li-treated patients was compared to patients with affective illness on psychotropic medications other than Li, no significant differences were noted.[198] Likewise, when renal biopsy specimens were compared between normal kidney donors, affective disorder patients on Li, and affective disorder patients prior to initiation of Li, it was noted that kidney abnormalities were more prevalent among the affective disorder patients and that these changes were independent of exposure to Li.[199] The presence of similar lesions in the appropirate control group raises valid questions as to the significance of the earlier reports.[176]

Reports of Li-related nephrotic syndrome have continued to appear,[178,193-196] and to date 11 have been described.[178] These patients have either minimal change, tubulo-interstitial disease, or glomerulosclerosis.[178] The variable histology and the small number of cases suggest concurrent separate diseases, but the fact that, in most cases, the nephrosis either improved or remitted completely when Li was discontinued, and, in three patients, Li rechallenge produced a recurrence,[178] suggests a cause-and-effect relationship, or at least a permissive role for Li.

Finally, acute severe Li toxicity has been reported to produce oliguric renal failure.[200,201] If the patient survives the acute toxic episode, renal function returns to normal.[201] Notably, the picture in these patients is often complicated with preexisting anorexia, diarrhea, and dehydration, and the question of a prerenal cause for the renal shutdown, rather than Li, has never been adequately addressed. Histological abnormalities in this group are not significantly different from patients who have never experienced toxic episodes.[177,197,200,201]

Endocrine Side Effects

Li affects a variety of endocrine systems. As mentioned above in the renal section, Li inhibits vasopressin activation of adenyl cyclase and subsequent cAMP-mediated events. Li also affects thyroid, parathyroid, and glucose metabolism.

Thyroid

As previously noted, Li decreases the sensitivity of the thyroid gland to thyroid stimulating hormone (TSH) and inhibits both TSH-induced thyroxine release and colloid droplet formation.[203] As with NDI, Li appears to interefere with the TSH second messenger, cAMP.[202] This Li-induced resistance to TSH causes an increase in plasma levels of TSH in 10% to 30% of patients receiving Li.[114-116,203,204] In most this is enough to maintain an euthyroid state, but 3% to 5% will go on to develop an euthyroid goiter[204-206]and perhaps another 3% to 5% may become hypothyroid.[114,204,206] Li has been advocated for the treatment of hyperthyroidism but is rarely used clinically.[207] Rare instances of Li-associated exophthalmos and hyperthyroidism remain unexplained.[208,209] Attempts to implicate antithyroid antibodies in the pathogenesis of these various thyroid abnormalities have not provided consistant results.[210-212]

Parathyroid and Calcium Metabolism

Li has been reported to produce a mild increase in free Ca as well as a clinical hypercalcemia,[213-216] but these findings are disputed.[217,218] Other workers have documented increased levels of parathyroid hormone (PTH) along with the increased Ca.[215,216,219,220] Furthermore, Li has been found to stimulate direct release of PTH *in vitro* from bovine[221] and human[222] parathyroid tissue at levels comparable to those produced by low Ca. The mechanism of this is unclear but may be related to Li's ability indirectly to displace active free intracellular Ca.[12] Aside from apparent accidental coexistance of parathyroid adenomas,[216] the effects of Li on Ca and PTH do not appear to be clinically significant.

Glucose Metabolism

Li has an antidiabetic effect in both man[118-120] and animals.[223] Li promotes direct uptake of the glucose derivitave 3-0-methyl glucose by body tissues *in vitro*[224] and increases glycogen storage in various tissues.[225] This insulin-like effect increases plasma glucagon and decreases liver glycogen stores.[226] Some of Li's effect may be mediated by its ability to interrupt the metabolism of glucagon-mediated cAMP.[12,121] Clinically, this antidiabetic effect has two major implications: 1) As previously stated, in some diabetic patients, readjustment of the insulin or hypoglycemic agent dose may be required. 2) In nearly 30% of nondiabetic patients receiving Li, this insulin-like effect may cause a nonfluid weight gain.[227,228]

Miscellaneous Effects

Li has been reported to have various effects on skin, including psoriasis, dermatitis, and alopecia.[171,229,230] Personal observations and the literature[172] support the complaints of patients that Li therapy worsens complexion and predisposes to acne-like reactions.

Effects on respiratory function have been reported. Despite a report of two cases of coincidental improvement of asthma at therapeutic Li dosages,[231] Li has been shown to decrease respiratory compensation in the face of increased inspiratory resistance.[232] Although these findings are not mutually exclusive, they suggest differing levels of concern. Li therapy should be reevaluated in the event of a deteriorating respiratory status.

Hematological effects of Li are prominent and have been discussed earlier.

Teratogenicity

Li given during the critical first trimester of pregnancy is a recognized teratogen. Through data gathered by the International Register of Lithium Babies, it was found that 11% of babies born to mothers taking Li and reported to the Register were born with congenital abnormalities (compared to 3% in the general population).[223] Cardiovascular abnormalities comprised 72% of the total malformations (compared with 12.5% in the general population).[233] Ebstein's anomaly of the tricuspid valve has been noted to be the most frequent in the Register data (33.3% *vs* 1.2% in the general population) and by other workers.[233,234] A Swedish cohort study found an incidence of 7% of congenital heart defects among offspring of bipolar women on Li, compared to 1% in bipolar women not on Li.[235] This study, which has superior methodology over the Register data, did not document a high incidence of Ebstein's anomaly.[235]

There are conflicting data regarding Li-induced chromosomal abnormalities.[236,237] However, since Li inhibits DNA polymerase activity[238] genetic abnormalities may be quite likely. Animals receiving over 10 times the therapeutic human dose develop a host of developmental abnormalities.[239,240]

Prophylaxis of Prophylaxis

Several recommendations can be made based on the data presented above. Prelithium workups should include base-line electrolyte values (sodium, potassium, chloride, carbon dioxide, Ca, magnesium, and phosphate), fasting glucose, renal function studies (urinalysis, serum creatinine, and serum urea nitrogen), thyroid studies (TSH, thyroxine, and triiodothyronine), and ECG. Formulas that predict Li dose may be used, but should not replace monitoring of Li levels. Once started, the Li level should be monitored at least weekly for the first three to four weeks, and monthly or bimonthly therafter until three or four consecutive levels are the same. In a stable maintenance patient, Li level may be checked three to four times yearly. Immediate Li levels should be obtained if the patient experiences any significant change in homeostasis (eg, infection, concurrent acute medical illness, etc). TSH is a sensitive and reliable screen for Li-induced thyroid dysfunction and should be measured three to four times per year. Likewise, creatinine as a screen for glomerular function, and specific gravity on urinalysis as a screen for tubular function should be undertaken three to four times per year. Additional laboratory evaluation should be done whenever there is sufficient clinical suspicion of homeostatic disruption.

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The Infant Walker: An Unappreciated Household Hazard

STEPHEN MARCELLA, M.D. AND BRUCE MCDONALD, M.D.

ABSTRACT—The potential for infant walkers to cause injury to infants was demonstrated by the results of a survey of the practicing pediatricians in the state of Connecticut. There was a significant number of severe injuries reported. In addition, seven cases of infants hospitalized at Bridgeport Hospital because of injuries sustained while using an infant walker are included. The survey indicated adequate knowledge of the apparent danger by the practicing physicians, including discussion during anticipatory guidance. Despite this knowledge and guidance, significant morbidity continues to occur.

Introduction

OVER the last several years, evidence has been accumulated implicating the infant walker as a significant cause of childhood injuries. Several studies have now documented the variety of the injuries most frequently associated with walkers.[1-7] There is also some evidence to suggest that certain aspects of motor development may be delayed by the use of an infant walker.[8-9] The attitudes of practicing pediatricians toward infant walkers has not previously been defined. To what extent are they aware of the association of the infant walker and serious injuries? Do they incorporate this knowledge into their anticipatory guidance?

There is evidence to suggest that pediatric organizations are becoming increasingly aware of these problems. In January 1987 the Canadian Medical Association urged the Canadian government to ban the sale of baby walkers.[10] In 1988, the Committee on Accident and Poison Prevention of the American Academy of Pediatrics recommended that pediatricians urge their patients not to use an infant walker. The prevalence of walker use, estimated to be 80% to 90% of six- to twelve-month-old infants, makes this a difficult challenge.

The situation is further complicated by the fact that walkers are often purchased well before the time they can be used often by individuals other than the parents of the infants. Since a child in a walker is mobile and upright, parents may perceive their child's develoment is being enhanced. Parents may also be under the mistaken impression that the restraint of a walker can safely limit their child's activity and exposure to injuries.

A mail survey was conducted to ascertain the current attitudes of all Connecticut pediatricians registered with the American Academy of Pediatrics concerning baby walkers and their experience with walker related injuries. Pediatricians were selected to participate because of their critical role as parent advisors. In addition, seven cases of infant walker related injuries are reported from the experience in the Department of Pediatrics at Bridgeport Hospital, which is a 600 bed community teaching hospital serving both an urban and suburban population.

Methods and Materials

A. *Survey:*

A questionnaire was distributed to 200 pediatricians practicing in Connecticut in 1987, as defined by the Connecticut Chapter of the American Academy of Pediatrics. It consisted of the following five questions.

1. How many walker-related accidents have you seen in the past year? In the past three years?
2. What types of injuries have you seen in the past year?
3. Do you include information on walkers in anticipatory guidance?
4. Do you discourage their purchase?
5. Do you feel walkers are beneficial?

B. *Case Reports:*

Seven case reports were obtained from the Department of Pediatrics at Bridgeport Hospital over a three-year period (1984-87) which reflected injuries severe enough to warrant admission to an acute care pediatric unit. This information was derived from chart review and represented less than 1% of all pediatric admissions.

Results

A. *Survey:*

Two hundred (200) questionnaires were distributed by mail and 196 (98%) were returned; of these, 180 (90%) contained sufficient information to be of us. Sixteen responses were excluded because of the respondent's limited involvement in pediatric practice. The survey was retrospective and relied on physician memory and office records and is subject to the bias of such surveys. The

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questionnaire was intentionally brief and was distributed with a stamped, self-addressed envelope, which we believe contributed to the extraordinary return rate of the survey. A second mailing was done to those who had not returned the first survey. The survey reported 53 skull fractures that had occurred in Connecticut in 1986 and that were related to infant walker injury. The total number of walker-related injuries in the past year, as estimated by these physicians, was 446; 1,109 injuries were reported to have occurred over a three-year period. These were injuries that were severe enough to be seen in an office. Among the most important injuries reported in 1986 were 53 skull fractures, seven fractures of the tibia, and 18 radial-ulnar fractures (Table 3).

Table 1
Physicians' Attitudes N=180

	YES	*NO*	*TOTALS*
Anticipatory Guidance *	155	24	179
Discouraged Use †	113	67	180
Beneficial‡	45	132	177

* One pediatrician did not answer this question on anticipatory guidance, but stated he did not discourage walker use.

† The 67 who "did not discourage use" included those who actively encouraged use as well as those who did not discuss them at all.

The 113 who discouraged their use also were part of the 155 who discussed the walker in anticipatory guidance.

‡ Three pediatricians stated "neither" when asked if walkers were beneficial or not.

The survey indicated that 155 (77.5%) pediatricians discussed the use of the infant walker in anticipatory guidance, and of these, 113 (73% of the 155, 63% of the total) actively discouraged its use. Twenty-four (22.5% of the total), however, offered no anticipatory guidance in this area. There were 132 practitioners who did not believe the walker was beneficial; however, 45 (25% of the total) believed it served a worthwhile purpose for the infant. The benefit was not described (Table 2). There were also a significant number of pediatricians (19 or 9.5% of the total) who did not think the walker was beneficial but did not discourage its use.

Table 2
Specific Injuries Reported by Physicians 1986

Skull Fracture	53
Finger Injury	22
Tibial Fracture	7
Upper Extremity Fracture	18

B. *Report of Cases:*

1. A seven-month-old fell down a flight of stairs in a walker impacting a concrete floor. He cried immediately, without loss of consciousness, but was noted to have periorbital swelling bilaterally. Skull and cervical spine radiographs were normal. He was hospitalized for 48 hours for observation without further difficulty.
2. A seven-month-old female infant fell down 10 steps, while in a walker, without loss of consciousness. The skull radiograph revealed a left parietal skull fracture. She was observed in the hospital for 48 hours and discharged home without known sequelae.
3. A nine-month-old infant fell down 15 steps in a walker. She cried immediately but was noted to have a 3-4 cm right parietal scalp depression. Skull radiograph revealed a minimally depressed skull, fracture in the same area. The computed tomographic (CT) scan did not reveal any evidence of intracranial pathology, and the hospital course was uneventful.
4. A four-month-old infant sustained a suprapubic hematoma with mild penile edema and ecchymosis after a fall down three or four steps in an infant walker. He was observed in the hospital for 24 hours and was discharged without sequelae.
5. A six-month-old infant was admitted suffering a left parietal fracture after a fall down 13 steps in a walker. He was hospitalized for three days without further incident.
6. A six-month-old male infant suffered a periorbital hematoma with a questionable loss of consciousness after a fall down 10 steps in a walker. He was observed for two days and discharged without further problems.
7. A six-month-old infant was admitted after falling down 15 steps in a walker. He had a sagittal skull fracture with multiple facial abrasions. A head CT scan was negative. He was hospitalized for three days. No complications were noted.

Discussion

Despite the limitations of a retrospective mail survey, this study, as well as studies previously reported,[1-5] indicates that the widespread use of infant walkers creates the potential for serious injury to an infant, particularly injury on stairs. This survey also reveals the attitudes and actions of pediatricians who especially are in a position to exert influence over the use of infant walkers. A majority (63%) of the Connecticut pediatricians actively discourage the use of walkers; nonetheless, the remaining minority (37%) of the responding physicians do not discourage their use; either because they feel they are beneficial or because they simply do not think they are harmful. The pediatricians who indicated that walkers were not beneficial to infant growth and development, but yet did not discourage their use were 9.5% of the total. This suggests a lack of appreciation of the association between infant walkers and injuries by a significant number of pediatricians in Connecticut.

Some pediatricians who discourage walker use commented that the incidence of walker-related injuries in their practices have decreased since they included walker use in anticipatory guidance. A few took a stronger stand and advocated their removal from the market. Some pediatricians commented on the misconception among parents that an infant walker may be beneficial or even necessary for their infant's development. Such misconceptions may indicate the need for additional information to be included in literature likely to be read by young parents.

Pediatricians who advocated the use of walkers as beneficial to development were not exempt from having to report walker-related injuries in their practice, but the cases they reported did not include a serious injury. Although these physicians were of the opinion that infant development may be accelerated by the use of a walker, some did comment that much of the "benefit" of the walker rests with the caretaker whose task is made easier.

In order to eliminate walker-related injuries, the public must be further educated concerning the walker's potential to cause serious harm. This implies early and vigorous anticipatory guidance by health care professionals against their purchase or use. They are often purchased in early infancy, and, therefore, this warning must be given at the prenatal visit. There remains a need for increased publicity by the organizations advocating for infants and children.

An alternative to such education would be the removal of all infant walkers from the market. This action is less likely to be accepted by a free-market society that has allowed firearms, all-terrain vehicles, and other hazardous items to be produced, advertised, and made readily available.

With appropriate efforts by the pediatric community and continued publication of appropriate warnings such as those we have reported, it may be possible to effect a change in the present state of infant walker use and injury — witness the recent legislation containing the sale and use of ATVs and the importation of assault weapons.

Pediatricians, as a group and individually, should continue to assume a responsible position for initiating these actions. If the efforts are to be effective, there must be increased participation. We must rid ourselves of any misconceptions about the "safety" or "benefit" of infant walkers and appreciate the magnitude of this health hazard.

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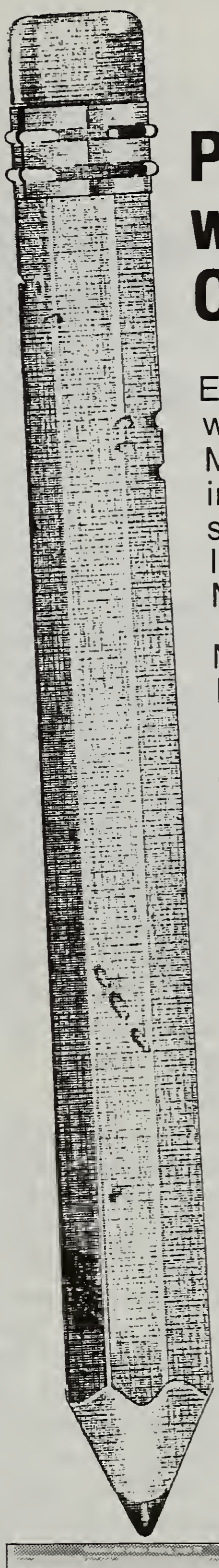

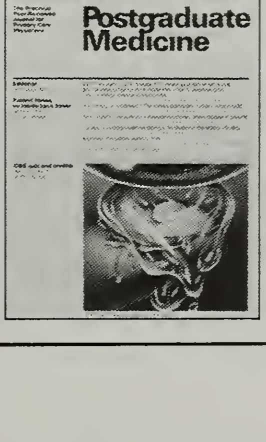

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Gastrointestinal Complications of Metastatic Malignant Melanoma

RALPH R. GARRAMONE, JR., M.D. AND H. DAVID CROMBIE, JR., M.D.

ABSTRACT—In a retrospective search of over 450 patients with melanoma, 13 were identified as having gastrointestinal metastatic disease. The clinical symptoms are nonspecific. The histology was either superficial spreading or nodular, and the depth of invasion was highly variable. The average survival of patients who underwent surgical treatment for symptomatic gastrointestinal (GI) metastatic disease was 14 months. We conclude that a subset of patients with malignant melanoma will present with symptomatic GI involvement, especially those with primary lesions of Clark Level III or deeper. Operative intervention in this group of symptomatic patients can be safe, and palliation for prolonged periods has been obtained. The authors encourage an aggressive diagnostic and therapeutic approach.

Introduction

MALIGNANT melanoma is a rare cancer accounting for 5% of all skin cancers and just 1-3% of all malignancies. However, its incidence and mortality are increasing. There is no malignancy that metastasizes more widely or involves more organ systems. It is responsible for 50-70% of reported metastatic lesions to the small bowel.[1] Although metastatic spread from a tumor originating outside the peritoneal cavity rarely involves the GI tract, malignant melanoma demonstrates the unusual predilection to do so. In autopsy series the frequency of GI metastases in patients with malignant melanoma is reportedly greater than 40%.[2] Over a 10-year period at Roswell Park all patients dying of malignant melanoma underwent postmortem examinations. The incidence of GI metastases in this group was 43.5%.[3]

Symptoms include chronic GI blood loss, abdominal pain, obstruction, and occasionally even perforation. These nonspecific presenting symptoms account in part for the delay in diagnosis as evidenced by premortem reports which have declared an incidence of only 4%, one-tenth of that seen in autopsy series.[4] The characteristics of the original cutaneous lesion are variable. The histology may be either nodular or superficial spreading, and the time interval from diagnosis of the primary to detection of the metastases can be considerable. Radiologic and endoscopic studies are essential in the timely and accurate diagnosis of GI disease. Palliation of symptoms can be accomplished by relatively simple surgical procedures.

Materials and Methods

During the 13-year period 1975-88, 455 patients with malignant melanoma were treated at the Hartford Hospital and enrolled in the tumor registry. At the time of this study 315 patients were alive and 140 dead. Of these, 13 patients were diagnosed as having metastataic disease to the GI tract. Nine of these patients underwent surgical treatment. Four of the patients were diagnosed at autopsy.

Results

This group of patients consists of three women and 10 men with a mean age of 60 years. Twelve of the patients presented with a previous history of malignant melanoma. In each of these cases the lesion had been biopsied and widely excised. In one patient, an as yet undiagnosed primary cutaneous malignant melanoma was found after presentation with GI bleeding. In six of the patients the primary lesion was nodular melanoma. The Clark Level ranged from III to V. In six of the cases the primary lesion was located on the trunk (Figure 1).

The clinical factors were variable and included GI bleeding in six; small bowel obstruction in two; and abdominal pain in two. Intussusception and perforation, although described in other series, did not occur in the patients we reviewed. The diagnosis of GI metastases was made at surgery in nine cases and at autopsy in four. Radiographic and endoscopic studies were essential in the diagnostic workup of these patients. Contrast enhanced studies of the GI tract together with upper endoscopy proved to be the most useful.

The average time interval between diagnosis of the primary lesion and the discovery of GI metastases was

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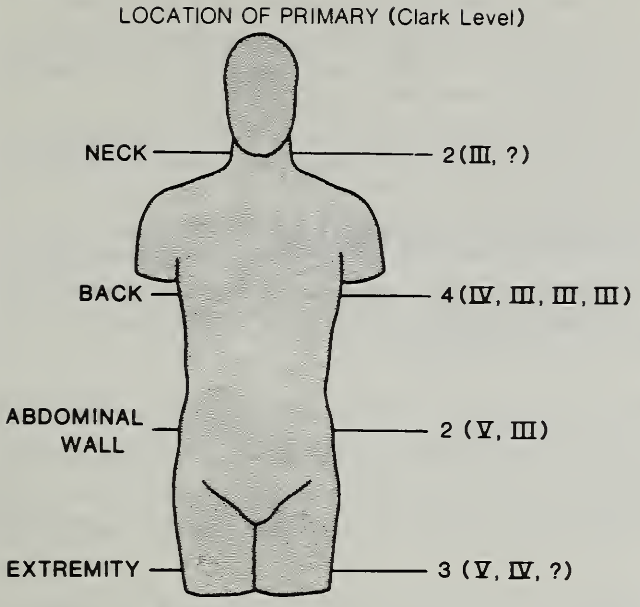

Figure 1
Location and Clark Level of Primary Melanoma.

40.8 months, with a range of 0-132 months. Metastases were located throughout the GI tract, and seven patients had multiple GI metastases (Figure 2). The mean survival following both diagnosis and treatment of GI metastases was 14 months. Palliation of symptoms was achieved in eight of the nine patients who underwent surgery (Table I).

Table I
Demographics, Histology, Time Interval to Discovery of Metastases, and Postoperative Survival

Patient	*Age/Sex*	*Histology*	*Primary Metatastic Interval (Mos.)*	*TNM Status*	*Survival (Mos.)*
1	56/M	Nodular	5	$T_3N_1M_0$	- +
2	62/M	Nodular	64	$T_2N_1M_0$	7 *
3	87/M	Nodular	3	$T_4N_0M_0$	48
4	51/M	Superficial Spreading	62	$T_2N_xM_0$	5
5	64/M	Nodular	35	$T_2N_0M_0$	- +
6	68/M	Nodular	30	$T_2N_xM_0$	3 *
7	78/M	-	-		9 *
8	31/M	-	11		- ++
9	75/M	-	30		- +
10	42/M	Nodular	132	$T_2N_0M_0$	12
11	44/F	-	8	$T_4N_1M_0$	- +
12	51/F	Acrolentiginous	84	$T_3N_xM_0$	24 *
13	77/F	-	18		10

* Patient still alive
+ Diagnosis made at postmortem
++ Perioperative death

Discussion

Although malignant melanoma metastasizes frequently to the GI tract, as demonstrated in autopsy series, this condition is seldom symptomatic necessitating a high index of suspicion for its diagnosis. The increasing incidence of malignant melanoma, the high frequency of GI metastases, and satisfactory palliation that can be achieved using relatively simple surgery illustrate the need for a more aggressive surgical approach to the diagnosis and treatment of this complication.

The anatomic site of the primary tumor does not seem to affect metastatic potential nor does the time interval since its discovery. Both superficial spreading and nodular lesions have been found to metastasize to the GI tract. In our review, the histology of most of the primary lesions was nodular. This is in contrast with a similar study involving six patients with malignant melanoma and visceral metastases: in five of these patients the original histology was superficial spreading.[5]

A patient with GI symptoms or chronic GI blood loss and a past history of Clark Level III or greater malignant melanoma should undergo a radiologic and/or endoscopic evaluation of the GI tract. Of these studies, the upper GI series with small bowel follow-through was essential since most metastatic lesions were located in the small bowel beyond the reach of the endoscope.

If a suspicious or an actual metastastic lesion is discovered, a palliative resection of the involved bowel should be undertaken. Our operative approach was directed only at the involved symptom-producing lesion, with resection and reestablishment of continuity. No postoperative chemotherapy or radiation was employed. Other investigators propose using a more aggressive surgical approach including extensive resection; however, a higher operative mortality without significant increase in survival does not seem to warrant this approach.[6]

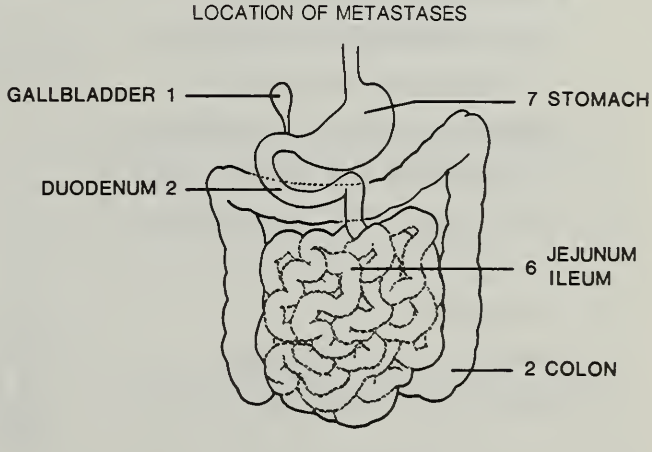

Figure 2
Location of Gastrointestinal Metastases.

In Jorge's review of 15 patients with visceral metastases from cutaneous malignant melanoma, the mean survival following operation was 7.9 months, with 14 of 15 patients receiving meaningful palliation.[7] In our study each patient who underwent an operation for symptomatic metastases to the alimentary tract received palliation of symptoms and the overall survival was 14 months, with four patients still alive an average of 10 months.

Although these results are promising, the real benefit of surgery is in palliation of symptoms. GI involvement by malignant melanoma is a late occurrence in the natural history of the disease. Of the patients with GI metastases over 80% already have lung involvement and over 70% have either brain or liver involvement.[3] Death in these patients is rarely secondary to their visceral metastases, which if left untreated will continue to be a source of morbidity and occasionally a cause of mortality.

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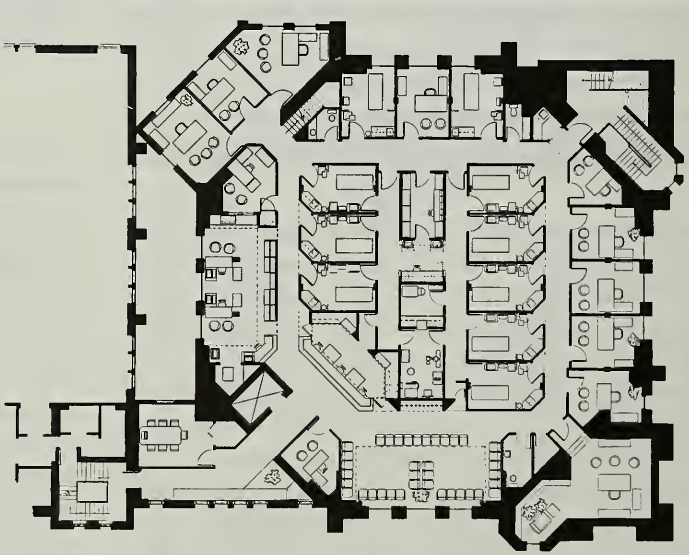

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Abstracts by Residents and Fellows

AMERICAN COLLEGE OF SURGEONS, CONNECTICUT CHAPTER

FOREWARD: The American College of Surgeons, Connecticut Chapter, held its meeting on 14 December 1988. The papers selected for presentation for the Annual Resident Cancer Competition are abstracted below. The moderator was Dr. Edward Dunn, Chief of Surgery, Waterbury Hospital and the judge was Dr. Paul Friedmann, Chief of Surgery, Baystate Medical Center.

Kirk K. Kazarian, M.D., F.A.C.S., Chief of Surgery, Department of Surgery, Stamford Hospital.

Paget's Disease of the Breast

RICARDO EUSEBIO, M.D. and PETER DECKERS, M.D., Department of Surgery,
Hartford Hospital

In this era of breast-sparing operations, Paget's disease of the nipple/areolar complex is usually treated radically in the belief that this malignancy is most often multicentric in the affected breast. Segmentectomy with or without radiation therapy is usually not advised. To define the optimal surgical treatment for this disease, a retrospective analysis of patients with a histologic diagnosis of Paget's disease of the breast treated at this hospital in the last 20 years was performed.

Forty-five patients with Paget's disease of the breast were treated between 1967 and 1987. Twenty-one patients were under 50 years of age. Twenty-four patients initially presented with a mass (four in the breast and 20 in the nipple/areolar complex). Eight patients presented with nipple bleeding and 30 with eczema of the nipple/areolar complex.

Twenty-two patients demonstrated infiltration histologically. Eighteen of these had a mass on physical examination. Twenty-three patients presented with in situ duct carcinoma of the nipple. Six of these had a mass clinically. Fourteen patients demonstrated multicentricity. Nine of these had a mass on initial presentation. Surgical therapy included either a modified radical mastectomy or a radical mastectomy. Nine patients had positive lymph nodes histologically. All presented with a breast mass. Chest wall recurrence occurred in 15 patients, 10 of whom had a mass at the time of initial presentation.

In conclusion, this study supports the use of axillary dissection in the treatment of Paget's disease if there is an associated mass. In addition, the presence of a mass is related to a higher incidence of multicentricity (64%) and a higher rate of recurrence on the chest wall. In contrast, those patients who do not present with a mass in association with Paget's disease have not demonstrated axillary lymph node metastases, have a lower incidence of multicentricity (36%), and a lower rate of recurrence (20%). These data suggest that patients without a mass need not undergo axillary dissection. Moreover, they may be eligible for segmental resection of the nipple/areolar complex with or without radiation therapy. If multicentricity is demonstrated at the margins of the segmentectomy specimen, a complete mastectomy is warranted.

Carcinoid Tumors of the Rectum

CYNTHIA KELLY, M.D., Department of Surgery, St. Francis Hospital

Carcinoid tumors of the rectum are rare and interesting lesions. The incidence is approximately 3/10,000 protoscopic examinations. Benign tumors are cured by excision alone, but the malignant variety is extremely aggressive. Histology cannot distinguish the benign from the malignant type of carcinoid tumors. A retrospective study of 165 patients with carcinoid tumors of the rectum found the only predictor of benignity *v* malignancy to be size ($p < .0001$). Carcinoid tumors < 2cm are benign lesions. Carcinoid tumors > 2cm are very malignant. Outcome could not be predicted by the presence or absence of liver involvement. Nor could outcome be predicted by the depth of invasion of the tumor alone. The outcome of those with malignant carcinoid tumors was dismal, and this outcome was not changed by surgical intervention. This represents the largest series, to date, in the world's literature.

Has the Incidence of Primary Gastric Lymphoma Increased?

JOHN HAYES, M.D. and EDWARD DUNN, M.D., Department of Surgery, Waterbury Hospital

Various reports from the surgical and gastroenterological literature have stated that the incidence of primary gastric lymphoma has increased. Other reports have claimed this is a relative increase or represents referral center bias. The purpose of the present study was to determine if the incidence of primary gastric lymphoma has increased in the community hospital setting. A total of 147 cases of gastric neoplasms were reviewed over a 10 year study period. The cases were divided into two five year periods, ie, 1978-82 and 1983-87. There were two cases (2.8%) of primary gastric lymphoma in the period 1978-82 and 11 cases (19%) in the period 1983-87. The difference in incidence of primary gastric lymphoma between these two time periods was statistically significant ($p = 0.01$ by chi-square analysis). This increased incidence of primary gastric lymphoma is difficult to explain, but it is important to recognize the prevalence of this disease. Surgeons and endoscopists must be aware that the incidence of primary gastric lymphoma may have increased. This recognition should help to improve endoscopic biopsy material for histopathologic examination.This in turn should help to increase the accuracy of preoperative diagnosis of gastric neoplasms. At the present time, endoscopic biopsy is of limited accuracy, thus the need for surgical exploration when the diagnosis is in doubt. In this small series of patients with primary gastric lymphoma, long-term survival was more likely in patients treated by subtotal resection. The role of postsurgical chemotherapy and radiotherapy remains uncertain.

Cystadenomas of the Pancreas

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Five patients with cystadenoma of the pancreas were treated between 1981-87. All patients were female, with an average age of 42 (range 29-64). Abdominal pain was the most common presenting complaint and was present in four of five patients; two patients had palpable abdominal masses. Four patients had serous cystadenomas; one patient had a mucinous cystadenoma. All patients were treated by resection (four distal pancreatectomies; one pancreaticoduodenectomy). All patients are alive and well one to seven years following surgery.

Use of Flow Cytometry to Predict Prognosis in Pheochromocytoma

ROBERT HAVLIK, M.D., STUART D. FLYNN, M.D., C. ELTON CAHOW, M.D.,
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Although recent developments in diagnostic imaging and pharmacology have simplified the treatment of patients with pheochromocytoma, prediction of malignant behavior in these tumors remains difficult. Criteria such as size, hormone production, and histopathologic appearance are unreliable. Since the mean interval from the time of initial surgery to discovery of metastatic disease may be as long as nine years, long-term follow-up of all patients on a yearly basis has been advocated by some despite the low incidence of malignancy in adrenal pheochromocytomas.

Recently, several studies have shown that the cellular DNA content analyzed by flow cytometry is an independent prognostic parameter in a variety of neoplasms. We performed DNA ploidy evaluation using paraffin-embedded archival tumor specimen blocks from 15 patients with pheochromocytoma.

Correlation of DNA histograms with clinical follow-up data showed that all patients whose tumors exhibited a diploid DNA profile are alive and well with follow-up ranging from three to 137 months. One patient whose extra-adrenal pheochromocytoma revealed a tetraploid pattern has no evidence of disease at 85 months. Of three patients with aneuploid histograms, two are known to be asymptomatic at six and 72 months. The tumors of two patients who died of metastatic pheochromocytoma are currently being analyzed.

In summary, flow cytometric evaluation of DNA content of pheochromocytomas may be of value in determining prognosis and planning follow-up. Our preliminary data confirm the strong correlation of a diploid pattern and a benign clinical course and suggest that patients in this group need be evaluated only if clinical symptoms or signs of catecholamine excess are present. On the other hand, presence of tetraploid or aneuploid profile should prompt at least yearly follow-up of patients using urinary catecholamine determination and/-or^{131}I metaiodobenzyl-quanidine (MIBG) scanning.

Rapid Carcinoid Tumor Induction in *Mastomys* with H_2 Receptor Blockade

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and K.A. ZUCKER, M.D., Department of Surgery, West Haven VA Medical Center and
Yale University School of Medicine

The relationship between gastrin, acid secretion, and carcinoid tumors has been extensively debated. Carcinoid tumor formation has been reported with prolonged achlorhydria in animals and man. The rodent *mastomys* has a genetic predisposition to gastric tumor formation. Loxtidine is an agent which results in irreversable parietal cell receptor blockade and achlorhydria. We hypothesized that ablation of parietal cell function would lead to loss of paracrine/endocrine control of acid secretion and the subsequent genesis of hyperplasia and neoplasia of gastric endocrine cells. We exposed mastomys (10 months of age, n=16) to H_2 receptor blockade. Loxtidine was administered at 1 mg/kg/day in drinking water for a period of four months. This dosage was chosen to mimic the human therapeutic range. We used both young (10 months of age, n=16) and old (20 months of age, n=16) to control for age related tumor development. Following four months of treatment with loxtidine, 14/16 animals had antral carcinoid tumors compared with 0/16 young (14 months old) and 4/16 old (24 months). Pathological classification of the carcinoid tumors found in the mastomys is displayed in the table.

	Invasive	Mucosal	Microcarcinoid	Hyperplasia
Cont. 14 mo.	0	0	0	4
Cont. 24 mo.	2	0	4	4
Loxt. 14 mo.	12	2	14	16

Immunohistochemistry demonstrated chromogranin and synaptophysin positive staining in all tumors. Similarly all ultrastructural studies showed cytoplasmic-dense core-haloed neurosecretory granules. At 24 months 4 controls had microtumors but none were seen in 14 month controls. Serum gastrin was elevated (230+ 40pmol/L) in loxtidine treated animals compared with controls (26+8pmol/L). These observations provide substantial support for the possible pathophysiologic role of gut peptides in the generation of neoplasia. The advent of endocrine tumors following inhibition of a secretory cell (parietal) is of considerable significance in understanding the genesis of endocrine neoplasia. Long term H_2 receptor blockade as an alternate to surgery may have potential grave implications.

Epidemic Explosion of Sigmoid and Cecal Cancer in the State of Connecticut: Lessons from the Connecticut State Tumor Registry

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West Haven VA Medical Center and Yale University School of Medicine

Previous studies have suggested that a left-to-right shift of the anatomic location of colorectal cancers has been occurring during this century. These studies indicate that the percentage of cancers occurring from the splenic flexure to the rectum are decreasing relative to percentage of cancers occurring in the proximal colon. Because of the importance of this issue to effective screening programs, we reexamined this question using data from the Connecticut State Tumor Registry. This tumor registry is the oldest registry in the United States and has compiled data on all cancers occurring in Connecticut residents since 1935. We initially looked at the more than 60,000 cases of colorectal cancer occurring from 1973, when a new site system was instituted, until 1985, the most recent data of records available. These data showed that while 63% of the cancers were from the splenic flexure to the rectum, 37% were in the proximal colon and 3% were site unspecified. Furthermore, there was no change in this relative distribution over the 13 year period. Using additional data from the registry, we were able to calculate the age-specific incidences and normalize these to the 1970 US Census in order to obtain sex specific age-adjusted incidences. These results are depicted in the table (new cases 100/1000/year).

	1935-39		1955-59		1980-84	
	Males	Females	Males	Females	Males	Females
Cecum	3.6	4.9	8.8	9.5	16.7	14.2
Sigmoid	8.8	7.7	13.4	11.9	18.7	12.8
Rectum	18.4	13.8	22.8	15.6	22.8	13.9

These data indicate that incidence of rectal cancer changed little during this 50 year period and that the incidence of rectal cancer in males is higher than in females. Furthermore, there has been a remarkable increase in cecal cancers (r=.990, $p \leq .001$) and sigmoid cancers (r=.991, $p \leq .001$). Indeed, in terms of absolute numbers of cases per year, cecal and sigmoid cancer cases have more than quintupled since 1935, while rectal cancer cases have paralleled the Connecticut census and failed even to double during that same time. This study revealed that the incidence of sigmoid and cecal cancer is climbing at epidemic proportions and that the incidence of rectal cancer is not decreasing but has remained remarkably constant for 50 years. These results suggest that future attempts at screening for colorectal cancer must address the increasing number of sigmoid and cecal carcinomas.

Treatment of Colonic Polyps with Stalk Invasion

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In order to allow the surgeon to evaluate properly the decision to operate upon a patient whose endoscopically removed pedunculated colonic polyp revealed cancer invasive of the muscularis mucosa but not the cut end of the stalk, we reviewed the mortality and morbidity of all colon resections with anastomosis for cancer at our institution from 1979-84 inclusive. Since the incidence of lymph node involvement associated with polyps containing invasive cancer is estimated at 3 to 5%, it seemed important to update the risk involved in surgical resection.

A total of 476 cases were reviewed and divided as follows: right colectomy and ileotransverse colostomy, 203; left colectomy and colocolstomy, 169; low anterior resection and colorectostomy, 72; subtotal colectomy and ileorectostomy, 25; and segmental resections with colocolostomy, 7.

Overall mortality (death within 30 days of operation) was 13 cases, or 2.7% including four patients whose procedure was palliative because of the extensiveness of their disease (metastatic) and associated systemic problems. There were 27 complications constituting a morbidity rate of 5.6%, mostly of minor consequence.

Since the procedure for a patient with pedunculated polyp with cancer invasion but a negative base of stalk would be limited resection with colocolostomy, one would anticipate that in a reasonably healthy person this could be done with an even lower mortality than the 2.7% noted above. In fact, all reasonable risk patients undergoing segmental resection in this review survived.

These data suggest that the morbidity and mortality, especially in segmental resections, is less than the risk of progressive disease in these patients and that resection should be advised as the most appropriate course of action.

Primary Immature Teratoma of the Cerebellum: Case Report and Review of the Literature

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Intracranial teratoma is rare, particularly over the age of 15, and favors midline occurrence. Atypical teratoma (germinoma) as a histological variant, represents the most frequent tumor of the pineal gland, and is histologically similar to seminoma. The purpose of this paper is to present an unique case of another cytological deviation, an *immature* teratoma, occurring laterally within the cerebellar hemisphere of a 24-year-old male. To our knowledge, this is the first intracranial case of this neoplasm (an undifferentiated tumor of possible germ cell origin without neuronal or glial differentiation) described.

The Role of Axillary Dissection in Postmenopausal Women with Breast Cancer

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The routine use of adjuvant chemotherapy in node-positive postmenopausal women still represents an area of controversy. The morbidity is higher and the gains smaller than in premenopausal women, where this represents the standard of clinical practice. In addition, the use of adjuvant hormonal therapy with tamoxifen has recently been advocated for all postmenopausal women, irrespective of nodal status. Finally, with our present understanding of the natural history of breast cancer, it is clear that axillary node dissection, in and of itself, probably adds little to long term survival in breast cancer. The primary role of axillary dissection at present is in guiding further therapy. With all these issues in mind, we sought to answer the following question: Did data from lymph node dissection influence further therapy in postmenopausal women? The study was a retrospective review of postmenopausal women in the Tumor Registry from 1983-85. The records of 85 women were reviewed, 75 of whom underwent axilliary node dissection as part of the procedure. Overall, 35% (n=26) had positive lymph nodes, and five patients were restaged on the bases of node dissection. Of the 26 patients with positive nodes, only eight underwent adjuvant chemotherapy. Thus, in this group of postmenopausal women, axillary node dissection led to chemotherapy only 11% of the time. Likewise, tamoxifen was instituted in only 10 of these patients (13%) on the basis of axillary node status. (And it would seem that the use of tamoxifen has become a nonissue.) We argue that most of these patients would have been better served by lumpectomy and breast radiation, and demonstrate that 85% of these tumors would have been amenable to lumpectomy on the basis of size and location (whereas in only 26% was lumpectomy used for the primary). We further argue that most of these lumpectomies could be done under local, as an outpatient. We feel that in the postmenopausal woman with breast cancer, axillary node dissection should be reserved for those women in whom the information will be used to institute further treatment.

Gastrointestinal Complications of Metastatic Malignant Melanoma

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Malignant melanoma accounts for approximately 1% of all cancers reported in the United States, and is the most common malignancy to metastasize to the gastrointestinal tract. In a restrospective search of over 450 patients with melanoma registered over the past 13 years, 13 were identified as having gastrointestinal metastatic disease. The Clark level ranged from III to V. In six of the cases, the primary lesion was located on the trunk. In four patients gastrointestinal involvement was discovered at autopsy. In the remaining nine patients symptoms of gastrointestinal involvement included bleeding in five, small bowel obstruction in two, and abdominal pain in two. Diagnosis of metastatic melanoma was made by radiologic and endoscopic procedures in eight patients. The average survival of the nine patients who underwent a surgical procedure for symptomatic gastrointestinal metastatic disease was 13 months. Four of these patients are still alive an average of 10 months. We conclude that a subset of patients with malignant melanoma does present with symptomatic gastrointestinal involvement, especially those with primary lesions of Clark's level III or deeper. Their presentation with obstruction and/or bleeding is nonspecific. They are often amenable to surgical treatment with the expectation of significant palliation and survival. The authors encourage an aggressive diagnostic and therapeutic approach.

Esophageal Carcinoma in a Community Hospital

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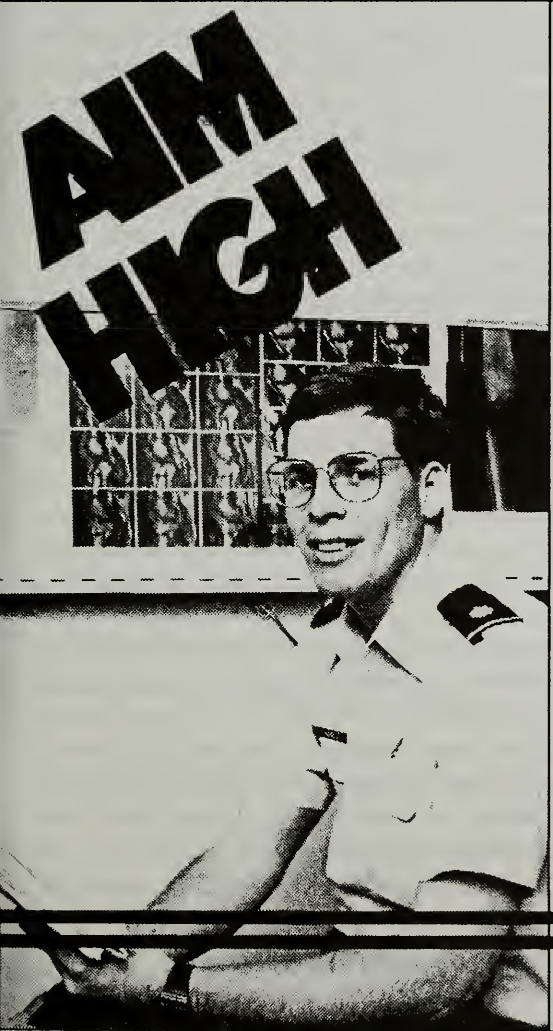
The value of palliative resection in esophageal carcinoma is uncertain. The dismal five year survival of 5% for whites and 3% for blacks (SEER-NCI) has led some gastroenterologists to refuse even to consider referring patients for surgical therapy. From 1980-87 all patients presenting to our institution with esophageal cancer were reviewed (n=68). Mean age was 66.2; male:female ratio was 2.6:1; 76% were white, 12% were black, and 12% were hispanic; 81% were smokers, 44% had a significant alcohol history. Ten percent of cancers were in the upper third, 46% were in the middle third, and 44% were in the distal third. Seventy-four percent were squamous cell and 18% were adenocarcinoma. Fifty-nine percent of the patients had no documented evidence of spread of disease. Only 43% of these, or 25% of the total, were actually resected, with most undergoing a classic Ivor Lewis procedure with a 30 day mortality of 17%. The rest (51/68) underwent either dilatation with or without laser only, or radiation, or chemotherapy/radiation combination. Mean survival of 17 operated patients was 8.5 months with one (6%) three-year survivor. Median survival was six months. Mean survival of non-operated patients was 11 months with five (10%) three-year survivors. Median survival was seven months. The mean and median survival rates are lower than the national figures found in a review of the literature. This may be because all cases seen in our community hospital were reviewed without a possible selective prejudice of being a major referral center. Also, the rate of surgical therapy is lower than average as is long-term postsurgical survival. With the universally poor prognosis fewer of our patients were referred by their primary care and gastroenterological physicians for surgical evaluation.



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Aerosolized Pentamidine in *Pneumocystis carinii* Pneumonia

ANGELA ON, PHARM.D.

Introduction

AEROSOLIZED pentamidine (AP), NebuPent®, has received approval from the Food and Drug Administration when used with Respirgard® II nebulizer to prevent *Pneumocystis carinii* pneumonia (PCP) in high-risk, HIV-infected patients. PCP is the most frequent life threatening opportunistic infection occurring in AIDS patients. It is the initial opportunistic infection in 65% of HIV-infected patients and 80% of AIDS patients develop PCP at least once.[1,2] Trimethoprim-sulfamethoxazole remains the drug of choice in treating PCP. Pentamidine isethionate administered intravenously has been shown to be an effective alternative in AIDS patients who do not tolerate trimethoprim-sulfamethoxazole.[3] Both conventional therapies have a 50% or a greater incidence of adverse reactions that necessitate a change in drug therapy.[3,4] AP has shown to be a promising alternative in clinical trials to treat PCP.

The relapse rate of PCP is high in AIDS patients. Most AIDS patients with a first episode of PCP who do not die from other causes will relapse within 18 months.[5] Trimethoprim-sulfamethoxazole has been shown to be effective in prophylaxis of PCP in AIDS patients with Kaposi sarcoma, although toxicity occurs in 50% of the patients (ie, leucopenia, rash).[6] Pentamidine, when administered by a nebulizer, has been shown in a dose comparison study to prevent PCP in AIDS patients with minimal adverse effects.

Clinical Trials

One open noncontrolled study involved 15 AIDS patients with initial episodes of mild to moderate PCP. A dose of 600mg of pentamidine was administered via Respirgard® II nebulizer for 25 minutes daily for 21 days. Thirteen of the 15 patients responded to the therapy. Of the two remaining patients, one died from progressive respiratory failure complicated by tuberculosis; the other was eliminated from the study because a mechanical ventilator was needed. Coughing was the major adverse effect. Systemic absorption was minimal with a mean serum concentration less than 10ng/ml.[7]

In another open randomized pilot study, inhaled or reduced dose pentamidine was studied for treatment of PCP. Thirteen patients with mild PCP inhaled pentamidine 4 mg/kg which was administered by a nebulizer (Ultra Vent) over a 30-60 minute period daily. Nine of the 13 patients had a satisfactory response and three patients could not be evaluated because of early withdrawal and one patient did not respond to treatment. Adverse reactions involved cough and bronchospasm. Very little AP was absorbed into the systemic circulation and approximately two-thirds of the plasma samples contained no detectable drug.[8]

A large scale, dose-comparative trial evaluated AP for the prevention of PCP in 408 AIDS patients. All patients were randomized into one of three treatment groups: 30mg every two weeks, 150mg every two weeks, and 300mg every four weeks. All doses were delivered in a standard manner via the Respirgard® II nebulizer system. The results of the trial demonstrated that the 300mg every four weeks regimen significantly ($p<0.01$) reduced the risk of developing PCP by 50-70% compared to the 30mg every two weeks regimen. The trial also further demonstrated a trend toward greater efficacy with 300mg every four weeks as compared to 150mg every two weeks. Differences in mortality among the three groups were not statistically significant. However, mortality from PCP was low in all three dosage groups.[9,10]

Safety of aerosolized pentamidine

AP when administered by a nebulizer has limited systemic absorption and thus fewer systemic side effects compared to IV administration. A study was done to

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examine the concentration of AP in bronchoalveolar lavage and plasma when administered intravenously and by aerosolization. Plasma concentration at the completion of inhalation was 5% of the mean peak plasma concentration achieved after IV administration.[11]

The most attributable complications experienced by the patients who received AP treatment were bronchospasm and cough (15-38%) which resolved by administering a bronchodilator prior to AP. Other most frequent adverse reactions (10-70%) reported from AP trials included fatigue, dizziness, rash, metallic taste, decreased appetite, nausea, chills, and vomiting. Less frequent adverse reactions (< 1-5%) reported during the trials were pneumothorax, diarrhea, anemia (usually associated with zidovudine (AZT) use) and abdominal pain.[10] One fatal case of pancreatitis, possibly associated with AP, has been reported.

Dose and Cost

The recommended adult dosage of AP for the prevention of PCP is 300mg once every four weeks administered via the Respirgard® II nebulizer. The dose should be delivered until the nebulizer chamber is empty (approximately 30 to 45 minutes). The aerosolized dosage for the treatment of PCP has not yet been established at this moment but a regimen of 600mg daily and 4mg/kg have been used in clinical trials.[7,8]

The acquisition cost of NebuPent® is $99.50 per 300mg and the cost of the Respirgard® II nebulizer is $10.00.

Summary

AP has been shown to be a promising alternative therapy to trimethroprim-sulfamethoxazole for the treatment and prevention of PCP in AIDS patients with fewer side effects than the systemic agents. More controlled clinical trials are still needed to establish the optimal dosage regimen for treatment and prevention of PCP. Clinicians should also be aware that disseminated disease caused by *pneumocystis carinii* involving organs other than the lung has been reported in patients treated with AP. The selection of an effective aerosol-delivery nebulizer is also very important to achieve high lung concentrations. The Respirgard® II nebulizer is the only one currently approved by the FDA for use with AP. Fisoneb, an ultrasonic nebulizer is currently under investigation for approval.

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Rising Health Care Costs: Telling the Truth!

TIMOTHY B. NORBECK

THOSE of us who labor with and for physicians are constantly reminded of a quote from Goethe, the German poet and writer, who said: "The truth requires constant repetition, because error is being preached about us all the time." Rising health care costs have become a fact of life to all Americans, and a particular concern to the corporate and governmental third party payers who foot most of the bill for us. Understandably, in their search for scapegoats, various politicians, bureaucrats, and corporate critics point to these increases to denigrate the entire health care system in general, and physicians in particular.

But the facts point instead to some very natural and predictable phenomena, such as an aging society, increasing access to care, effective but costly new technology, inflation, and an increasing utilization of services by a people whose penchant for self-abusive life-styles is well documented. To harass the medical profession for such costs is popular, but serves only to further delay addressing the true roots of the problem.

The Medicare Program was passed by the Congress in 1965 and first took effect in 1966 primarily for the purpose of providing universal access to health care services for our elderly. Of course, as is usual for any government program, actual costs far exceeded original cost estimates. In 1966, the federal soothsayers predicted that the 1990 cost of the program would be $8.8 billion. The actual figure is going to be some $95 billion.

The fact is, if a health care program serving elderly people is really effective, they will survive and continue to get older and frailer over the years. Financial outlays will always rise as more and more of them continue to access increasing amounts and levels of effective health services. Instead of acknowledging this fact of life, some public servants in Washington prefer to blame the increasing expenditures on physicians. And unfortunately, as Eugene McCarthy once suggested: "Anything repeated three times in Washington becomes fact."

A myriad of regulations and fee controls have been imposed on physicians, but they continue to be singled out for blame, even when their fees remained frozen in place. A look at Medicare statistics clearly shows that physicians are *not* to blame for the increased costs of the program. The truth, and it has been confirmed by HCFA and the Treasury Department, is that the *rate* of growth in Medicare Part B expenditures for physicians' services has been declining substantially in the past few years and has increased by only 5.4% between 1987 and 1988.

The *Good* News

Of course overall Medicare costs have indeed escalated. There are approximately 500,000 new enrollees added every year, and the percentage of those who seek care has risen 28% over the past 10 years. In addition, the overall number of visits to physicians by those 65 and over has increased 17% from 1983 to 1987. Also, our 85 and over frail elderly population has expanded by almost one million in the past nine years, and the trend continues. This is *good* news, not bad, and truly a tribute to the quality of their medical care. However, it also means that they will continue to access increasing levels of costly health services into their 90s and beyond.

When asked recently by a newsman what things were like in her day, a pert octogenarian snapped: "My dear boy, *this* is my day!" And well it is; thanks to excellent medical care and new technology, the 85-and-over group is the fastest growing segment of our population—expected to reach five million from its present 2.9 million in just 11 years from now. It should not surprise or disappoint us to note that our elderly account for approximately 36% of our health care costs despite comprising only 12% of our population. And these numbers will keep growing even if inflation were to stop dead. For the first time, the average American has more living parents than children! Four-generation families are now the norm, not the exception.

In spite of these successes in longevity, captious critics continue to repeat the time-worn and patently unfair indictment of America's medical care system because the

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TIMOTHY B NORBECK, Executive Director of the Connecticut State Medical Society.

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U.S. "ranks 16th in the world in life expectancy and 17th in infant mortality." Such harping betrays either ignorance or ill will, and is wearing very thin. For a huge, heterogeneous, open and free society, such a rank is not surprising, considering the many developed nations in the world, especially those with smaller, homogeneous, and controlled populations. The tragedy of infant mortality has a lot more to do with the reporting mechanisms utilized, an inordinate number of teen pregnancies, intractable poverty, drug and alcohol abuse during pregnancy, and failure to seek (or to accept) even free prenatal care, than it does with the efficacy of our medical care system.

These same critics promote their own agenda by gratuitously claiming that there is no demonstrably superior standard of care in this country as compared to others. If this is so, perhaps they ought to explain why foreign patients travel to the U.S. from all over the world for our prompt, quality, high-tech medical care. The traffic is *not* moving in the opposite direction! As comedian Jack Paar once put it, "*Immigration* is the sincerest form of flattery."

The American Life-Style Has a High Price

Despite the world's best and most accessible medical technology, U.S. life expectancy is indeed below some other countries, but the chief culprit is our life-style. We enjoy the most affluent and self-abusive life-style in the world, and so we have the medical costs to prove it! There *is* something to the Japanese proverb that "good medicine always has a bitter taste." Maybe that's why the stoic Japanese lead the world in longevity.

And speaking of life-style, that most important ingredient in rising health care costs, the numbers are shocking. Starting with our children, the President's Council on Physical Fitness and Sports reports that in its tests of children from ages five to eight, 40% already showed risk of heart disease. Of some 400 teenagers who took a basic fitness test in the National Children and Youth Fitness Study, only 36% could pass. A Chrysler Fund/AAU Physical Fitness program director concluded that American children are becoming more sedentary and are suffering from such life-styles. The Centers for Disease Control report that the proportion of adults aged 18-65 participating three times a week in vigorous, 20-minute exercise should be 60% instead of the present 8%.

The Senate Select Committee on Nutrition and Human Needs reported that six of the 10 leading causes of death in the United States are linked to diet. "Americans", the committee concluded, "are risking their health by eating too much fat, sugar, cholesterol, and salt, and not enough fruit, vegetables and grain products." In a study of Virginia National Guardsmen over 40 years old, only 29% of the participants passed the first phase of basic cholesterol, blood, and other tests. Before the Army could complete treadmill stress testing, two Guardsmen died during the exercise. The Medical Director exclaimed in horror, "These were combat units!"

Perhaps the most recent victim of our life style is the late former Yale President and Baseball Commissioner, Bart Giamatti. An immensely likable and brilliant man, he had spoken with talk show host Larry King one year before his death. Giamatti told him that he had never really tried seriously to stop smoking. "My father had heart problems," he said, "so I should be thinking of it. I suppose I'll give it a try but I wouldn't bet on it. You know, Larry, smart people do dumb things." What a tragedy, since smoking probably contributed to his premature death.

Robert Blank, author of *Rationing Medicine*, says that approximately 80% of illnesses are linked to individual behavior—smoking, alcohol, illicit drug use, poor diet, obesity, sexual promiscuity, and other high risk activities. "Futhermore," he says, "four percent of the people in the United States account for 55 percent of all hospital costs." But government has paid little heed to the wise adage, "an ounce of prevention is worth a pound of cure." In fact, we spend less than one percent of our health bill on health education and promotion - despite an obvious crying need for it. As Emerson once noted, "the government has been a fossil; it should be a plant."

Real Solutions Do Make a Difference

What effect does this have on rising health care costs? In truth, plenty! Worried about the skyrocketing cost of premature births, Sunbeam Corporation started a mandatory prenatal course that has slashed the average cost per baby by nearly 90%. Quaker cut its employees' hospital costs by 58% with health education and a fitness program. Johnson and Johnson reported that after 25% of its employees had stopped smoking, hospital costs plummeted 35% and absenteeism was reduced by 20%. Chrysler found 3.4% of its employees using 43.5% of the company's hospital payments. The high-cost cases often involved life-style related diseases that were preventable.

As demonstrated above, companies will save far more in health care costs by following those examples than by railing against physicians for utilization or by arguing over second opinions. The Kimberly Clark Corporation created a wellness program that includes fitness facilities and confidential counseling for substance abuse. Not so coincidentally, this company's per-employee health costs are about *half* of the national average for workers in the paper industry. "Cure people's ills," goes an old Chinese saying, "and make them healthy for a day; teach them to stay well, and make them healthy for a lifetime."

To Life!

Despite our sloppy personal habits and self-destructive life-styles, Americans possess a fierce desire to live as long as possible—and may the costs be damned! A recent Louis Harris poll indicated that 71% of respondents opposed letting insurers set any financial limit on lifesaving medical treatments. A survey of intensive-care unit patients in a Chicago university hospital showed that a surprising number—some 70% of them—were 100% willing to undergo intensive-care treatment again, regardless of the cost and trauma, in order to achieve even one more month of survival. Only 8% were completely unwilling to undergo such care to achieve any prolongation of life.

This "lust for life," understandable as it may be, translates into a further strain on our health care funding resources. Perhaps that partially explains why 25 to 35% of Medicare expenditures go to that 5 or 6% of enrollees who will die within a year. A PBS documentary even suggested that up to $50 billion is spent in this way.

Perhaps one of the most remarkable statistics to emerge of late was reported recently in *Business Week* magazine. The article mentioned that on average, 85% of an individual's health-care expenses occur in the last two years of life. Physicians have very little control over such expenses. But living wills, medical-legal ethics committees, and our courts and legislatures will be dealing with this issue for a long time to come. Another Harris survey asked Americans how much they would spend on new medical technology to save a life. The survey people quit asking at $1 million because the respondents could not define an outer limit. Clearly the American people want *more* money spent on their health care, not less.

And how good is that expensive technology which the bureaucrats are so quick to criticize? (Unless, of course, they or their families are in need of it.) Writing in the 1700s, Voltaire once said cynically that "the role of the doctor is to amuse the patient until nature effects a cure of does not." How times have changed! How many would-be victims of dread disease or trauma are walking around today as productive, happy, taxpaying Americans, who a decade ago would have been only names on a tombstone!

Today's physicians can operate on pancreatic and colon cancers which 20 years ago often could not even be diagnosed in time. Tremendous strides have been made in burn therapy. In the past, people with burns on 35% of their bodies had only a 50-50 chance of survival. Today patients covered with burns on 60% of their bodies have that same chance or better to survive. Each year, 1.5 million Americans suffer heart attacts; the good news is that now most of them survive, thanks to the high-cost technology waiting for them.

Some may recall the story in an April *New York Times* article about a New Jersey woman who received seven new artificial joints: two shoulders, two hips, two knees, and one ankle. Two years ago this real-life bionic woman danced at her daughter's wedding. In 1987, 556,000 shoulder, elbow, wrist, hip, knee, ankle, foot, toe, and finger joints were replaced in the United States, according to the National Center for Health Statistics. The cost? — well worth it to the recipients and their families, but probably unacceptable to the government and corporate rationers who would rather lower our coverage and access to last year's lowest common denominator than permit open competition to bring about tomorrow's medical wonders. Maybe that is why there are said to be more MRI scanners in the city of Chicago than in the entire socialized health care system of Canada.

Today more than 80% of newborn babies weighing from 1.2 to 2.2 pounds survive. Just 15 years ago, 70% of them died. But despite the new technology for saving lives and improving the quality of life, and despite physicians who are better trained and more skilled than ever before, costly medical malpractice suits still continue to proliferate. And the fear of these suits itself costs the system another $30 billion a year in "defensive medicine" costs. Part of this problem undoubtedly is the result of a public which has come to believe that medicine can—and should—be able to accomplish anything. According to philosopher Leonard Peikoff, today's standard, in effect, demands of the doctor not responsible care, but omniscience and omnipotence.

As Robert Samuelson has noted, "high technology medicine is both the glory and the curse of our health care system." Perhaps this paradox is explained by George Bernard Shaw's words: "We have not lost faith, but have tranferred it from God to the medical profession." Flattering though that may be to physicians, the responsibility is too great; that faith is too short-lived; and unlike God, physicians are not immune to prosecution.

How Much Good Health Is Too Much?

So how much is too much to spend for good health—particularly for a people clearly negligent in caring for themselves? Is 11% of our Gross National Product too much, or too little? When asked if spending 15% on health care and less on other things would be too much or not, 61% of the respondents in a national poll said that 15% was *not* too much; only 28% thought it was too much, and 11% were unsure. This attitude echoes that of former British Prime Minister Benjamin Disraeli, who expressed it better than any politician, past or present: "If the health of the people is really the foundation upon which all their happiness and powers as a state depend, how much is too much?"

Inflation, of course, has had its effect on health care as it has on every other commodity. The purchasing power of a 1986 dollar was only 22 cents when compared with its 1950 counterpart. If nothing else had changed, health care costs would have risen almost five times between those years because of inflation alone. For some, access may have become *too* easy. White House adviser William Roper maintains that most employer health plans encourage excessive use of medical services by providing first-dollar or nearly first-dollar coverage. This insulates employees from the full impact of rising costs and leaves them unconcerned about using services economically.

Physicians' fees, a favorite target of the critics, will only increase by five % during 1989 and will *not*, for the seventh time in 10 years, even keep pace with the cost of living increases. According to *Medical Economics*, median practice net income was up just 1.2 percent in 1988 while inflation rose 4.4 percent. And it should be noted that physicians' services account for about 20% of all health care expenditures, a percentage which has remained unchanged since 1950.

Once referred to as the "flowers of our civilization" by Robert Louis Stevenson, physicians now resemble Ambrose Bierce's picture of a doctor as "one upon whom we set our hopes when ill, and our dogs when well." This abuse is being heaped upon physicians not only in the media but also in government, corporate suites, and union halls. Those third parties who pay for rising health care costs are unimpressed that their money is buying more access, more good health, and longer life than ever before. Their agenda begins and ends at their own bottom line.

Inevitably, the results of our societal ills and irresponsible life-styles are increasingly costly. In the name of fairness, still an American virtue, blaming physicians for these rising costs is akin to blaming the police for more crime. But fairness itself, alas, is fast disappearing from press and podium. This unjustified glooming of American medicine goes on, and undermines the morale of practitioners who are giving their patients—us—medical care that is the envy of the world. The commercial media, with its own agenda, has allowed politicians to overlook unpopular realities and crassly lay the blame for increased medical costs at the feet of physicians, who must, as ever, play the role of Sophocles' proverbial "messenger who brings bad news."

There is no question but that our total health costs are higher than they have to be, and they will continue to be incredible. But why dump on doctors, when the *real* reasons are so obvious? It is not the health care that is unnecessary, but much of the *illness* that is unnecessary, and indeed preventable, given sufficient public and private motivation.

What else could anyone expect in America but rapidly rising health-care costs, with three million desperate drug abusers now at large on the streets of our cities and towns? Eighteen million alcohol abusers are loose on our highways and turnpikes. Fifty-five million tobacco abusers are suicidally causing 1,000 costly, painful deaths *each day*. And nearly one million *new* cases of venereal disease are adding to our society's existing burden every year. But that is not all. Waiting in the wings are growing crises in long-term care, homelessness, Alzheimer's disease, the uninsured and underinsured "working poor," and the burgeoning tragedy of a million or more men, women, and babies infected with the AIDS virus.

Prevent Illness—Not Health Care!

The Northwestern National Life Insurance Company has issued a study analyzing the healthiness of the population in each of the states. The state with the highest health ranking was Utah. It led the nation in the lowest overall disease-factor ranking and had the lowest incidence of cancer and the second lowest incidence of coronary heart disease and mortality. And guess what else Utah's population was lowest in. Surprise! Utah had the lowest prevalence of smoking and of alcohol consumption and ranked second in physical exercise. Isn't this just what physicians have been saying all along?

"Facts don't cease to exist just because they are ignored," Huxley observed. Instead of obstructing care givers, our government, business and insurance sectors must greatly expand their role in health promotion and education, in preventing unhealthy life-styles, in alleviating poverty, and in assuring medical coverage for the uninsured. For too long, those in public service have not wished to risk offending voters by telling them the simple truth: that we ourselves and our destructive life-styles are the problem. It has been far easier instead to rail against physicians and hospitals for rising health care costs.

Who will step forward and have the courage to say that we must either shape up and be prepared to expend more for the damage already done, or pay the piper in the form of rationing the quantity and lessening the quality of our health care? Who will acknowledge that the public's desire for *more* rather than less health care is a *legitimate* and *praiseworthy* goal for an affluent and generous and peace-loving people, as long as no one is left out? *All* citizens should enjoy such a benefit without partiality.

But there are the "working poor" whose employers provide no coverage, and the needy persons in many states where Medicaid covers only a fraction of those in poverty. They are not entirely left out, but at present when they access the system (often too late and too little), the cost of their care is "absorbed," that is, shifted to private patients and their third-party payers. But the lag in diagnosis and treatment results in greater intensity and mortality than their more affluent compatriots experience from the same diseases. Adequate coverage of their own would encourage more prompt and cost-effective access, as well as more favorable outcomes.

Telling The Truth

Who will finally tell the *truth* to Americans? The truth is that our health-care system is a huge, wholesome, vibrant, and very high-tech sector of our economy. It employs 8.5 million compassionate Americans at every skill level and in every city, town, and hamlet. It is a magnificent American success story and the envy of the world. And it is capable of even greater successes; no one has to be left out.

Yes, it is also true that our health-care costs are approaching 12% of our GNP, and worth every dollar. All of us without exception will benefit from it more and more as time goes on. That is why it is so important that this pluralistic system be preserved and protected from those in government and business who would gut our hospitals and medical centers and undermine our physician-patient relationships. Indeed, what other sectors of the economy have been more deserving of public and private support and enthusiasm?

Of course, medicine should continue its efforts to reduce remaining waste and abuse. But these diminishing factors are not the cause of increasing health-care costs. Also, let us not hold our breath waiting for our current business and entertainment cultures to begin promoting healthy life-styles as effectively as they now promote indulgence in rich foods, tobacco, alcohol, and loose living.

But our government, at least, though often influenced by these commercial forces, should keep the health of the people and the prevention of illness among its very top priorities.

If something has got to go, let it not be the good health of Americans!

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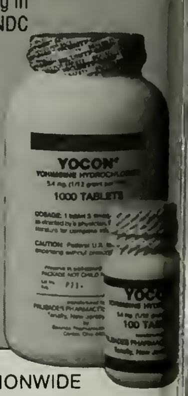

Medical Student Research Day

UNIVERSITY OF CONNECTICUT SCHOOL OF MEDICINE

Introduction

Each year in April a full day is set aside at the University of Connecticut School of Medicine for students to present papers describing research work done by them in collaboration with members of the faculty. Seven abstracts from the papers presented last spring appear below. Two of the students, Elizabeth E. Goff, M.D. and Gregory C. Gallant, M.D. have since graduated.

Flow Cytometric DNA Ploidy Analysis in Stage I Breast Carcinomas: A Correlation Between Recurrence and Aneuploidy and Tumor Markers

Stage I breast cancer (node-negative, <2cm, and no metastasis) has the most favorable prognosis, although there is still approximately a 30% recurrence rate (DeVita, 1985). This study examined the correlation between DNA ploidy and the incidence of recurrence in women with Stage I breast cancer. Aneuploidy and proliferative activity have been correlated with grade and prognosis of various neoplasms and have been shown to identify more precisely high risk patient subsets. Reports have shown an association between aneuploidy and recurrence in Stage I node-negative breast cancer patients (Dressler, 1975). To identify the most significant predictors of recurrence in this patient subset, an analysis of estrogen receptor (EG) and progesterone receptor (PR), B72.3 antibody reactivity, and menopausal status, were also made. Thirty-one consecutive cases of Stage I, node-negative, infiltrating ductal carcinoma patients with available tissue were selected from the Mt. Sinai Tumor Registry between 1977-1980. Fifteen of these patients subsequently had recurrent disease during a follow-up period of at least seven years. The diagnosis was confirmed by histopathological review of slide material. Flow cytometric analysis was performed on propidium iodide-stained cell suspensions prepared by a modified Hedley technique of formalin-fixed, paraffin-embedded tissue with diploid control tissue from normal breast or lymph node tissue. ER and PR analysis had been performed previously by dextran coated charcoal assay. The B72.3 antibody was determined by immunohistochemistry using the same tissue. Aneuploidy was identified by flow cytometric analysis in 7/15 (47%) of patients with recurrent disease, but in only 1/16 (6%) of nonrecurrent patients. Thus, 7/8 (87.5%) of aneuploid positive patients developed recurrent disease. All other factors in both the recurrent and nonrecurrent disease patients, including evaluation of postmenopausal status and whether ER, PR, and B72.3 positive, showed no significant correlation with disease status. The data suggest that the presence of aneuploid populations of tumor cells in Stage I infiltrating ductal breast cancer is a strong predictor of recurrent disease. Thus, by using flow cytometric analysis along with other tests, the clinician may be able to identify more precisely the high risk patient.

PAMELA M. DUKE, Second-year medical student; MARGARET FALLON, M.D., Assistant Professor of Pathology; JEFFREY ORELL, M.D., Assistant Professor of Medicine; DAVID WILBUR, M.D., Assistant Professor of Pathology.

An Isometric Extra-Articular Anterior Cruciate Ligament

The anterior cruciate ligament (ACL) is the most frequently injured ligament in the body. When torn it causes a great deal of knee instability. Surgical treatment of the anterior cruciate deficient knee has classically been divided into intra-articular *v* extra-articular reconstruction; this distinction is made upon whether the ligament is anatomically recreated (intra-articular) or whether an extracapsular sling is created to prevent joint subluxation. Extra-articular reconstruction has fallen from favor because it was felt to stretch out and fail over time. Our interest in extra-articular ligament reconstruction was renewed when we located a set of graft points we felt were isometric.

We performed a kinematic study of the lateral side of the human knee to observe the behavior of the distances separating Gerdy's tubercle on the anterolateral tibia, and the femoral attachment sites of several common extra-articular ACL reconstructions. A new fixation site described by Fulkerson as 5 mm directly proximal to the posterior superior attachment of the lateral collateral ligament (LCL), which we felt was nearly isometric (Point I) was also studied.

Six human cadaver knees, denuded of skin and fat, were secured by the femur to a testing apparatus and a constant load applied through extensor mechanism. The distance between a series of femoral points and Gerdy's tubercle were measured with a caliper every 15 degrees from 0 degrees—120 degrees of knee flexion. Femoral attachment sites were: point I, Fulkerson's point; at the proximal anterior (point II) and posterior (point III) femoral origins of the LCL, simulating a graft drawn under the LCL; high and proximal to the LCL (Krackow's point) (point IV); two points adjacent to the insertion of the distal lateral intermuscular septum (points V and VI); and "over the top" (point VII).

The over-all length change, defined as the great length minus the shortest length from 0—120 degrees for point I averaged 5%; point II, 23%; point III, 13%; point IV, 14%; point V, 12%; point VI, 16%; and point VII, 12%. In addition, the distance between Gerdy's tubercle and points I, III, and IV were greatest at full knee extension, points II, V and VI at full flexion, and point VII greatest between 60 — 75 degrees.

We concluded that an extra-articular reconstruction from Gerdy's tubercle to point I produces the most favorable reconstruction, as it is nearly isometric, tightening slightly in full extension. Our data also suggest that previous extra-articular reconstructions failed because the graft elongated too much (>10%) throughout normal knee motion. Using isometric principles, we feel an extra-articular reconstruction to point I should not elongate over time and give the surgeon a viable alternative to intra-articular ACL reconstruction.

PETER B. LOPEZ, Second-year medical student; K. P. SHEA, M.D., Orthopedics Fellow (Sports Medicine); G. GALLANT, Fourth-year medical student; JOHN P. FULKERSON, M.D., Associate Professor of Orthopedic Surgery.

Regulation of Major Histocompatibility Gene Expression

The Class I genes of the murine major histocompatibility complex (MHC), designated H-2K, H-2D, and H-2L, encode for cell surface molecules involved in immune recognition of tissue-associated foreign antigens. Changes in MHC gene expression can result in a failure of cytotoxic T lymphocytes to recognize foreign antigen-bearing cells. Of particular importance has been the observation that tumor cells expressing low levels of MHC Class I antigen can escape immune detection. An investigation into the molecular mechanisms involved in the regulation of Class I MHC gene expression in murine leukemia was undertaken. In order to measure the gene activity of an individual member of this multigene family it was first necessary to prepare and determine the specificity of a DNA probe for the H-$2K^b$ gene. Southern blot experiments demonstrated that single stranded DNA probes prepared from the second exon of H-$2K^b$ were low copy and detected only a small subset of MHC Class I genes. These probes were subsequently used to investigate the nature of the H-$2K^b$ loss phenotype in somatic cell variants derived from an Abelson virus transformed murine leukemia (designated R8). Transcription assays were performed to determine (1) whether the absence of steady-state K^b mRNA in one such variant (R8.116) was due to lack of transcription of the K^b gene or instability of K^b mRNA and (2) if the genes present in R8 were subject to repression by a labile protein regulator. In the first of these experiments, it appeared that transcription of nascent K^b mRNA was reduced in the R8.116 K^b loss variant. These data suggest that there is regulation at the level of mRNA synthesis although they do not rule out the possibility that post-transcriptional factors (eg, variations in mRNA stability) also play a role in the regulation of K^b gene expression for this K^b loss variant. In another line of investigation it was shown that K^b transcription was induced by protein synthesis inhibition, as evidenced by the many-fold increase in K^b mRNA in R8 cells treated with cycloheximide. This latter result suggests that a repressor may act at the level of transcription to regulate K^b gene expression in the Abelson-leukemia virus transformed cell line. In summary, these data are interpreted to indicate that the H-2 genes in the R8 pre-B cell leukemia are subject to transcriptional down regulation by cycloheximide-sensitive factors. The attenuation of MHC Class I gene expression may influence the tumorigenecity of this leukemic cell line by providing a mechanism for escape from immune detection.

DENEEN E. PELLETIER, Second-year medical student; RICHARD A. ZEFF, PH.D., Assistant Professor of Pathology.

The Effect of Forskolin on PGE_2 Production by Neonatal Mouse Calvaria in Vitro

Parathyroid hormone (PTH) increases cyclic adenosine 3′,5′-monophosphate (cAMP) and prostaglandin E_2 ((PGE_2) production in bone. The purpose of this investigation was to determine whether or not cAMP is likely to be the second messenger for the effects of PTH on PGE_2 production. Therefore, the effects of the adenylate cyclase activator forskolin (FSK) and the phosphodiesterase inhibitor isobutylmethylxanthine (IBMX) on medium PGE_2 production were studied using neonatal mouse calvaria in vitro.

Seven-day-old neonatal mouse calvaria were dissected, divided into halves, and cultured in a chemically-defined medium (BGJ) supplemented with 1 mg/ml bovine serum albumin at 37° C in a humidified atmosphere of 5% CO_2 in air. The calvaria were incubated in the presence or absence of cortisol (10^{-8}M), FSK and/or IBMX at different concentrations, or with PTH (10 ng/ml). Medium PGE_2 production was measured by radioimmunoassay and the amount of stable calcium in the medium was measured by colorimetry.

Forskolin produced a dose-response increase in PGE_2 production, both in the presence or absence of cortisol (cort):

	PGE_2 release (nM)			
	no Cortisol		*Cortisol 10^{-8}M*	
	6h	*24h*	*6h*	*24h*
Control	1.7 ± 0.3	2.8 ± 0.6	0.3 ±0.1	0.2 ± 0.1
FSK 10^{-9}M	2.4 ±0.4	3.5 ± 0.6	0.6 ±0.1	*1.7 ± 0.6
10^{-7}M	2.4 ± 0.4	4.6 ± 0.7	1.3 ± 0.3	*1.4 ± 0.2
10^{-5}M	*9.2 ± 1.4	*16.8 ±2.8	*1.5 ± 0.2	*4.0 ± 0.5

(values are mean ± S.E.)
(* $p<0.05$ when compared to controls)

In preliminary data using IBMX, there was an increase in medium PGE_2 production after treatment with IBMX (10^{-5}M) when compared to controls (C) after 24 h (IBMX: 5.4 ± 1.3, C: 2.8 ± 0.6 nM). In addition, there was an increase in medium PGE_2 production after treatment with IBMX (10^{-5}M) in the presence of cortisol (10^{-8}M) and PTH (1 ng/mL) when compared to cortisol and PTH alone after 24 h (IBMX, cortisol, and PTH: 2.1 ± 0.4, cortisol and PTH: 0.8 ± 0.2 nM).

In conclusion, treatment with the adenylate cyclase activator FSK produces an increase in medium PGE_2 production. Also, treatment with the phosphodiesterase inhibitor IBMX appears to produce an increase in medium PGE_2 production. Therefore, this study supports the hypothesis that cAMP is likely to be the second messenger for the effects of PTH on PGE_2 release by bone.

PETER N. BOWERS, Second-year medical student; J. KLEIN-NULEND, PH.D., Postdoctoral Fellow; LAWRENCE G. RAISZ, M.D., Professor of Medicine.

Nurses and AIDS: Factors Associated with Personal Concern

We investigated factors associated with concerns about acquiring AIDS and with use of self-protective behavior among nursing personnel. Nurses (n=274) in a large inner city hospital in the Northeast were asked to complete anonymously a 42-item questionnaire which assessed demographics, risk, concerns, glove use, attitudes about AIDS and AIDS patients, personal experiences with AIDS, and knowledge of AIDS. A total of 193 questionnaires were returned, for a response rate of 70%. Chi square tests were used in bivariate analysis to determine if knowledge, attitudes, or experiences were associated with concern and whether concern was associated with behavior. Forty percent of the nurses were not at all or mildly concerned about acquiring AIDS from their patients, while 60% were moderately or extremely concerned. Most respondents (94%) answered at least five of seven knowledge questions correctly. Almost half of the nurses were moderately or extremely reluctant to perform procedures on AIDS patients and half of them expressed some resentment about caring for patients with AIDS. Thirty-six percent of the nurses believed that they had a moderately or extremely high risk of acquiring AIDS. Most nurses (88%) reported always wearing gloves when working with the blood of patients with known HIV infection or AIDS. When working with the blood of patients with known risk factors for AIDS, 64% reported always wearing gloves, while 30% reported always wearing gloves when working with the blood of patients not suspected of having HIV infection. High levels of self-reported protective behavior were associated with high levels of concern about acquiring AIDS. Level of knowledge was not significantly associated with level of concern. Greater perceived risk of acquiring AIDS, resentment of AIDS patients, and reluctance to care for patients with AIDS were all significantly associated with a high level of concern. The strong association between high levels of self-reported protective behavior (glove use) and high levels of concern suggests that concern may contribute to glove use. The observed lack of association between knowledge and concern suggests that educating nurses about AIDS may not be enough to alleviate concerns and fears. These data suggest the potential importance of emphasizing the emotional aspects of AIDS in educational programs aimed at modifying the behavior of nursing personnel.

LISA M. RINALDI, Second-year medical student; JERI HEPWORTH, PH.D., Assistant Professor of Family Medicine; GAYLE MADDEN, R.N., Department of Family Medicine.

Doxorubicin-Induced Calcium Release from Cardiac Sarcoplasmic Reticulum Vesicles

The purpose of this investigation was to elucidate the mechanism of the Ca^{2+} release channel in cardiac sarcoplasmic reticulum through the study of doxorubicin and caffeine induced Ca^{2+} release. For Ca^{2+} release assays, the SR vesicles (0.05 - 2.0 mg/ml - prepared from dog hearts) were incubated at 37° for five minutes in a reaction mixture containing 0.15 M KCl, 20 mM MOPS (pH 6.8), 5 mM $MgCl_2$, 10 mM NaN_3. 0.26 mM EGTA, and 0.03 - 0.4 mM $^{45}CaCl_2$ (10^4 cpm/nmol). Active Ca^{2+} uptake was started by addition of 2 mM ATP to the reaction mixture. Ca^{2+} release was triggered by addition of doxorubicin or caffeine in various concentrations and stopped at various times by millipore filtration (0.45 um) of aliquots of the reaction mixture. Addition of either doxorubicin ($C_{1/2}$ = 5μM), or caffeine ($C_{1/2}$ = 0.8 mM) triggered Ca^{2+} release from canine cardiac SR loaded with $^{45}Ca^{2+}$ in the presence of 2mM ATP. The maximal amount of Ca^{2+} release triggered by doxorubicin (38% of the total loaded Ca^{2+}) was significantly higher than that released by caffeine (25%). Plots of the amount of Ca^{2+} release triggered by 20 μM doxorubicin or 2mM caffeine versus free Ca^{2+} concentration were bell-shaped, with maximal release at 0.2 μM Ca^{2+}. Ca^{2+} release triggered by either 20 μM doxorubicin or 2mM caffeine was inhibitied by ruthenium red (0.1 — 2μM), ryanodine (1 - 100 μM), or tetracaine (0.1 — 1 mM), whereas 2 mM caffeine did not further activate Ca^{2+} release triggered by 50 μM doxorubicin suggesting that the drugs may share the same Ca^{2+} release channel.

ARTHUR B. LANDRY, III, First-year medical student; ARNOLD KATZ, M.D., Professor of Medicine; DO HAN KIM, M.D., Assistant Professor of Medicine.

The Role of Tumor Necrosis Factor in Acute Murine Cytomegalovirus Infection

We examined the role of tumor necrosis factor (TNF) in acute cytomegalovirus (CMV) infection in mice by determining the effects of both passive transfer of antibody to TNF and administration of exogenous TNF. BALB/c mice were given PBS, normal rabbit serum, or anti-TNF rabbit serum intraperitoneally (IP) two hours before being infected with $1x10^5$ or $4x10^5$ pfu MCMV given IP. Mortality rate was determined and on day 14 salivary gland, lung, and spleen were assayed for virus content. In a second set of experiments, the effect of exogenous TNF on acute infection was examined. Mice were infected with 10^3, 10^4, or 10^5 pfu MCMV given IP, subcutaneously (SC), or intranasally (IN). Mice were then treated with 0, 0.1, 0.5, 1.0, or 5.0 μg MuTNF per day SC on days one through nine post MCMV infection. On day 10, salivary gland, lung, and spleen were assayed for virus content. Passive transfer of polyclonal rabbit antibody against TNF protected mice against mortality during acute MCMV infection. Some protection was also noted in mice receiving normal rabbit serum and this effect was not altered by heat inactivation. Passive transfer of antibody to TNF led to significantly decreased titers in the lung, spleen, and, in some cases, the salivary glands. Exogenous TNF administration during acute infection led to significant increases in MCMV replication in the lung, but not the spleen. Salivary gland titers increased following SC and IN, but not IP infection. Neither TNF nor antibodies to TNF affected MCMV replication in vitro. These results suggest that TNF plays an important role in MCMV infection. Exogenous TNF increases organ virus titers (particularly in lung) while passive transfer of antibodies to TNF reduced virus titers in some organs. The role of TNF appears to be highly complex, involving the intricacies of the immune system since there is no direct effect of TNF or antibodies to TNF on MCMV in vitro. The mechanism by which normal rabbit serum protects against mortality is unclear but is probably related to some nonspecific up-regulation of the immune system. These results provide evidence that a role for TNF exists, although the exact mechanism by which it influences CMV infection remains unclear. With further understanding of the role of TNF in CMV as well as other infectious diseases, rational strategies for therapeutic intervention may be developed.

ELIZABETH E. GOFF, Fourth-year medical student; JOHN D. SHANLEY, M.D., Associate Professor of Medicine; R.J. DEBS, M.D., Assistant Professor, Cancer Institute, University of California-San Francisco School of Medicine.

Divided Loyalties in a Corporate Era

SARA L. SWENSON

Appleton-Lange Publishers sponsored an essay contest in 1988 for medical students to celebrate its 50th year in medical publishing. The winner was Sara L. Swenson, a student at Yale University School of Medicine. Her prize-winning essay, "Divided Loyalties in a Corporate Era," was published in November 1989 in *Academic Medicine.* Both Ms. Swenson and *Academic Medicine* have given us permission to reprint this essay in *Connecticut Medicine.* - Ed.

TRADITIONALLY, technological advances have raised the most vexing ethical dilemmas in medicine. Treatment decisions in the neonatal intensive care unit, organ transplantation, and questions of defining death amidst an array of life-support systems have highlighted the moral dimensions of medical decisions and challenged ethicists and physicians to clarify competing values and their relative weights in decision making. Emerging technologies hold out new moral quandaries for the 1990s. Reproductive and genetic screening techniques will merge to produce embryo biopsy, fetal tissue transplants for neurological disorders will give a new edge to the abortion debate, and our skills at producing humans who live longer but not necessarily healthier lives will focus attention on the end of life and the distribution of health resources among "competing" age groups. Future technologies, however, will not present the most formidable challenges. The corporatization of medicine—both publicly through government regulation and privately—poses the most important ethical challenges to physicians in the 1990s. The changing environment of health care delivery threatens the integrity of the patient-physician relationship as one that has healing as its ultimate goal and views the physician as a moral agent who acts in the patient's best interests.

Physicians have always operated in the context of a larger society with its specific history, laws, and institutions. Why should this context prove ethically problematic in the 1990s? Two factors—a growing preoccupation with medical costs and new mechanisms of health care delivery—combine to place ethically troubling demands on physicians. These factors, coupled with physician surpluses, technology, and medical specialization, have contributed to the recent expansion of the "medical industrial complex." Physician autonomy has eroded as salaries replace fee-for-service payment schemes and the health professions become increasingly stratified.[1] Large corporations that run health maintenance organizations (HMOs), preferred provider organizations (PPOs), and other prepaid plans comprise a growing share of the medical "market." HMOs, for example, provided health care to 27.7 million people in the United States in 1987, compared with 10.5 million in 1982. Especially noteworthy is the proliferation of for-profit enterprises; they enrolled ten million people in 1987 and will probably continue to grow.[2]

Governments also seek to control the financial organization of medicine. By setting fixed reimbursement rates for inpatient services, Medicare's diagnosis-related groups (DRGs) typify federal efforts to curb costs. State policies, such as Oregon's recent refusal to provide Medicaid coverage for organ transplantation, have also begun to reflect the realization that public coffers are not bottomless. An aging population whose medical expenses are primarily funded through Medicare and Medicaid, growing numbers of Americans with inadequate health insurance, concerns about quality of care, and the ever-increasing proportion of the GNP consumed by health care expenditures will probably prompt even more diligent government involvement in medicine.[3]

The incentives and constraints physicians face under these changes vary. Under DRGs, hospitals profit by limiting services and restricting the patient's length of stay. Although sparse evidence exists regarding DRGs' impact on patient care, hospital stays have declined, and several authors have noted the potential pressures on physicians to discharge patients "quicker and sicker."[4] The private sector also uses a range of mechanisms to persuade health care providers to contain costs. These include financial incentives, education, utilization review, and limitations on the number of referrals. HMO doctors are frequently penalized for excessively costly care and rewarded on the basis of company profits or individual productivity.[5] Thus, government pressures toward

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SARA L. SWENSON, second-year medical student, Yale University School of Medicine.

cost-containment, the increasingly corporate organization of health care, and the proliferation of for-profit medicine place physicians under ethically questionable constraints and incentives.

Changes in everyday medical discourse reflect these changes in the surrounding environment. Terms such as "case management," "cost-effective care," and "discharge planning" reveal how the language of bureaucracy and private enterprise permeates medical care. Patients are now "health care consumers" who have seemingly untrumpable "rights" to direct what the medical marketplace has to offer. Physicians, in turn, become "health care providers" while the hospital "industry" voices concerns about "portfolio planning," "managing patient mix," and "physician marketing."

A new model of the relationship between doctor and patient is evolving in response to medicine's transformation. In order to evaluate its impact on physician-patient interactions, I will briefly compare it with the traditional fiduciary model of the doctor-patient relationship. Although diverse perspectives exist regarding this relationship, several elements capture its unique dimensions. First, the fact that physicians heal illness—physical or mental—necessitates a degree of intimacy seldom deemed acceptable in other interactions between clients and professionals. Second, we permit doctors to poke, probe, and even dig inside our bodies precisely in order to achieve the higher end of healing. Thus, as Leon Kass argues, medicine represents an inherently *moral* pursuit, one that is characterized by the restoration and preservation of health.[6] Third, patients expect that doctors will work to achieve these ends. This not only places awesome responsibilities on physicians but plays a powerful role in the healing process. Since an appropriate diagnosis and treatment requires honesty on the part of the patient, the patient's trust in the physician neither to divulge communicated information nor to act contrary to their common interest in the patient's health is essential.

As medicine enters the marketplace, some argue that health care becomes simply an economic good that—like automobile tires or toothpaste—one purchases according to one's ability to pay. The patient, or consumer, is responsible for educating herself about available options and exerts control over the services physicians offer through purchasing power. Legal notions of the patient as a rational, autonomous agent further inform this model. The patient becomes an equal partner in medical decision making. Thus, the doctor possesses a unique set of skills, and medicine is defined by individual preferences and the ends of a given society.

In "Divided Loyalties for Physicians: Social Context and Moral Problems," Thomas Murray notes the dilemmas physicians face when their roles within social institutions conflict with their fiduciary relationships to individual patients.[7] Murray notes that such dilemmas arise from the need for physicians to participate in social control. He also stresses the significance of (1) what patients expect of physicians; (2) the moral values served by medicine; and (3) the ethical centrality of the patient-physician relationship in understanding and resolving divided loyalties dilemmas. How are we to understand the dilemmas doctors face in the changing context of physician-patient relationship? If our patients are rational consumers, will such dilemmas prove less problematic or dissolve away entirely? Or if medicine represents more than the delivery of and payment for goods and services, how can we reconcile the physician-patient relationship with the altered organization of medical care?

Current changes in the health care system do reflect a perceived need for physicians to function as agents of social control. The underlying assumption is that physicians ought to take responsibility for the costs of medical care. Examining the aims of such control highlights one important difference between trends toward privatization versus efforts to exercise government authority over health care. In private enterprises, the benefits produced by physician cost-containment accrue primarily to the corporation or the individual physician. In contrast, efforts to control public expenditures offer the potential for benefiting the larger society. Funds "wasted" through the ineffective delivery of health care can be retargeted toward preventive medicine or other pressing social needs, such as education or low-income housing. Moreover, public decisions to direct physician behavior may reflect community standards of health care priorities and thus represent some notion of the public good. If such choices arise from a public consensus, government intrusions into the physician-patient relationship seem less ethically troubling than those from private corporations.

Cost-containment mechanisms are designed to alter physician behavior. Consequently, their successes will probably indicate that physicians do allow financial considerations to influence treatment decisions. However, the question remains whether such incentives and the behavior they elicit actually prove detrimental to patient welfare and thereby give rise to dilemmas of divided loyalties.

Advocates of prepaid care plans argue that fee-for-service arrangements financially reward physicians for using technology-intensive treatments and penalize those who spend time talking to patients or focus on preventive care.[8,9] Prepaid care plans, in contrast, exert pressures toward undertreatment. Are there ethically relevant distinctions between pressures to overtreat or undertreat patients? Doing "less" for one's patient is not necessarily medically pernicious. Given the invasive nature of many current therapies and their potential iatrogenic effects, overtreatment may present greater risks than undertreatment. Still, most people in contemporary American society tend to equate "more" with "better" care. While less intensive treatments might serve patients' best interests, the thought that one's physician is motivated not to offer potentially beneficial treatments seems a special affront to the trust patients place in physicians. In this respect, financial constraints or incentives put physicians in ethically compromised positions.

Thus, patient expectations play a central role in evaluating this dilemma. Incentives to limit the utilization of medical resources may prove less problematic if one thinks of physicians and patients as "providers" and "consumers." Consumers generally expect profit to motivate those who sell their services. In fact, we encourage consumers to take responsibility for making wise purchases. If necessary, societies can deter flagrant abuses by either creating more informed patients or establishing "consumer protection" measures, such as the 1987 budget amendment that prohibits Medicare-participating HMOs from offering doctors financial incentives for reduced services. Assuming physicians act first and foremost in their own interests evades the question of divided loyalties dilemmas.

However, if patients still expect doctors to act solely on their behalf, the dilemma remains. One response to misperceptions created by such expectations is to require doctors to disclose institutional mechanisms that potentially constrain their ability to act in the patient's best interests. In advocating that HMO physicians inform patients about referral restrictions and financial incentives, Douglas F. Levinson goes a long way toward resolving the dilemma of divided loyalties.[10] An awareness that physicians serve as "gatekeepers" or that one's discharge from the hospital does not depend solely on physical status may prompt patients to voice doubts and disagreements forthrightly. To the extent that patients know their own interests and can act in accordance with them, the provision of information enhances patient autonomy and makes patients active participants in preserving their own health.

Even so, openly acknowledging one's "divided loyalties" has ethical implications even if it fails to produce adverse effects on "objective" standards of care. For if doctoring involves more than correcting enzyme deficiencies or prescribing anti-inflammatory agents, the nature of the physician-patient interaction matters. The qualified trust patient-consumers accord health care providers may hamper, if not preclude, good medical care, especially if financial pressures repopularize communication and clinical diagnostic skills as cost-effective methods of providing treatment.

Moreover, a closer examination of the doctor-patient relationship suggests a deeper problem with the consumerist approach to medical care. Patients usually seek out doctors because they are sick. This fact immediately introduces vulnerability and dependence into patient-doctor relations and may compromise patients' abilities to act rationally or autonomously. Thus, an inevitable power imbalance exists between the healer and patient that extends beyond disparities in training or knowledge base. Patients and their families possess values and desires that have moral relevance to treatment decisions, and doctors and other health care professionals should work with patients to incorporate these preferences into treatment decisions. Yet, physicians cannot ignore the dynamics of the physician-patient interaction and the special obligations that flow from them.

Practicing medicine in the 1990s challenges physicians to preserve those aspects of the physician-patient relationship they deem essential to good medical care. Keeping the patient in view amidst cries of cost-containment may prove difficult, but doctors ought not succumb to societal pressures that would reduce patients to consumers. Avoiding financial arrangements that compromise patient trust and opposing constraints that ignore the needs of individual patients represent first steps toward an ethical response. If doctors want to be more than technological wizards, they should seek with their patients to rediscover the ends of medicine before society does it for them.

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How to Handle a Medicare Reopening Letter

KYLE L. BALLOU, J.D.

APPROXIMATELY 75 out of every 1,000 practitioners received a "Medicare reopening letter" in Connecticut in 1989. A reopening letter is the Medicare carrier's* notification to a physician that he or she has been selected for review.

Medicare, like the Internal Revenue Service for federal income tax returns, conducts audits of practitioners on a routine basis, or for repetitive, inconsistant practices by a physician. They also pursue complaints made to them about a practitioner. This article is intended to provide guidance if you should receive one of these letters.

What to Do When Notified

When a physician is notified that he or she is under review by Medicare, the carrier should immediately be called and requested to provide clarification and more information. However, the practitioner should *not* provide the carrier with any information during this call. It is in the physician's best interest to protect whatever information he or she may have that the carrier would or should not have access to.

The Procedure

The initial letter that a physician receives from Medicare is known as a "reopening letter." It will indicate the area of the physician's practice being reviewed (office visits, consultations, etc.) and the time frame of the review.

After the review is completed, a meeting between carrier personnel and the physician is arranged. The results of the audit and the identified overpayment are explained to the physician during this meeting. The physician is told that he or she may submit a rebuttal to the findings in the audit. Consent settlements (voluntary refund of a projected overpayment based upon the audit's findings) are explained to the physician.

A letter is sent to the physician after the rebuttal has been reviewed and a final projected overpayment has been determined. In the letter, the physician is asked whether he or she wishes to sign a consent settlement. Signing a consent settlement waives a physician's right to a fair hearing.

If the physician does not agree with the consent settlement letter, the next step is the "final determination letter." The final determination letter is based on either a 100% or a "statistically valid" audit of the physician's claims. The physician should be informed of the reason for the audit, the period to which it applies, and the sampling procedure to be used.

Receipt of the final determination letter triggers certain time limitations on a physician's rights and liabilities. If payment is not made within 30 days of the final determination, interest begins to accrue. The fact that interest accrues, however, does not necessarily mean that the physician must pay it. As will be discussed below, should the physician successfully appeal the demand, no payment at all is made. Alternately, the matter may be settled and the interest forgiven as part of the settlement.

Also beginning 30 days after the final determination, the carrier may start recouping or offsetting the alleged overpayment from the physician's future Medicare payments. If an appeal is requested within this 30 day period, the carrier is to make every effort to conclude the appeal procedure before the period ends. However, offset can begin after the 30 days has elapsed, regardless of the appeal's status. If the physician succeeds on appeal any excess amount withheld as offset should be refunded.

Medicare appeals for claims filed prior to 1 January 1987

(This is the same procedure for any *Medicare appeal)*

Should the physician disagree with Medicare's determination and wish to contest the entire matter, certain postfinal determination hearing rights do exist. For claims of at least $100 filed with Medicare prior to 1 January 1987, the physician's only avenue of appeal is a "Medicare fair hearing." A request for a fair hearing

*The Travelers Companies

KYLE L. BALLOU, J.D., Director of Government Relations, Connecticut State Medical Society. Adapted from an article by Jefferey M. Alexander in the *Rhode Island Medical News* Vol 3, No. 10, pp 8-9, October 1989. Attorney Alexander is a partner in the law firm of Edwards & Angell in Providence. He specializes in health care law.

must be filed with the carrier within six months of the final determination, unless extended for good cause. This review also is available if the physician's request for payment is not acted upon with "reasonable promptness" (ie, within 60 days).

At the fair hearing, a physician may submit evidence, present and cross-examine witnesses and appear personally, through a representative, or not at all. The carrier appoints the hearing officer who, in practice, rarely modifies the carrier's determination significantly. Furthermore the hearing officer is without authority to decide any regulatory or administrative issue or fact which exclusively is within federal jurisdiction, but only may decide issues directly related to the individual claims before him or her. The decision of the hearing officer is final and binding except in specific circumstances.

Appeals for Claims Filed After 1 January 1987

The law has changed for claims arising after 1 January 1987. If the amount in controversy is at least $100 but less than $500, there are no further appeals beyond the carrier's fair hearing, described above. However, if the amount in controversy is $500 or more, the physician is entitled either to a fair hearing by the carrier or a regulatory hearing before an administrative law judge (ALJ). An ALJ hearing must be requested within 60 days of receiving the final determination. Furthermore, if the amount in controversy is $1,000 or more, the physician is entitled to appeal the ALJ's decision to a federal district court.

Time Limitations

Medicare may reopen its audit and review of a physician's claims for any reason within 12 months of its final determination. After one year but within four years, further investigation is allowed for good cause, including discovery of new or material evidence, clerical error, or basic error in the final determination. A Medicare audit is available at any time if fraud or an established pattern of excessive or medically unnecessary billing is suspected.

M.D. Health Plan Moved

On 2 March M.D. Health Plan moved to new facilities at Crossroads Office Park, 6 Devine Street, North Haven, 06473. In addition to providing MDHP staff needed space, a new Hewlett Packard Computer will be in place with a capacity to support a membership of 100,000 members. A new computerized telephone switchboard will be also installed which will correct the problems that you and your offices have experienced recently due to our explosive growth.

The telephone numbers will remain the same: 776-5759, to be used if you are calling from New Haven County, and 1-800-345-9272 throughout the rest of Connecticut.

Around the State

The Annual Meeting of the Fairfield County Medical Association is scheduled for Wednesday, 18 April, at the Danbury Hilton Inn. A special afternoon session will focus on stress factor in medical practice.

"Geriatric Update: State of the Art 1990" is the title of a symposium scheduled for 25 April 1990 at the Treadway Hartford Hotel in Cromwell. This program is sponsored by the Connecticut State Medical Society in cooperation with the Connecticut Academy of Family Physicians. **Andrew D. Weinberg, M.D.**, Branford, is the program director. For more information, call Dr. Weinberg at (203) 488-6755.

"Smoking Cessation as Part of Usual Care" is the title of a course to be held 10-11 May 1990 under the auspices of the Yale University Department of Internal Medicine. The course director is **William S. Beckett, M.D., M.P.H.**, Associate Professor of Medicine, Department of Internal Medicine and Epidemiology and Public Health. The American Lung Association of Connecticut is cosponsor. **C. Everett Koop, M.D., Sc.D.**, will be the keynote speaker.

For further information call the Office of Postgraduate and Continuing Medical Education, Yale University School of Medicine, 785-4578 or 785-7168.

G.O.F. Jensen, M.D., pediatrician in Bristol, has recently been elected Fellow in the Royal Society of Health (London). Dr. Jansen earned his MPH degree in 1989 from The University of Connecticut School of Medicine.

As its Medical Staff Dinner, The Park City Hospital honored **Maurice Levinsky, M.D.**, on the occasion of his retirement after 59 years. One of the hospital's founders and at 90 years of age, he was, upon his retirement, the oldest member of the medical staff.

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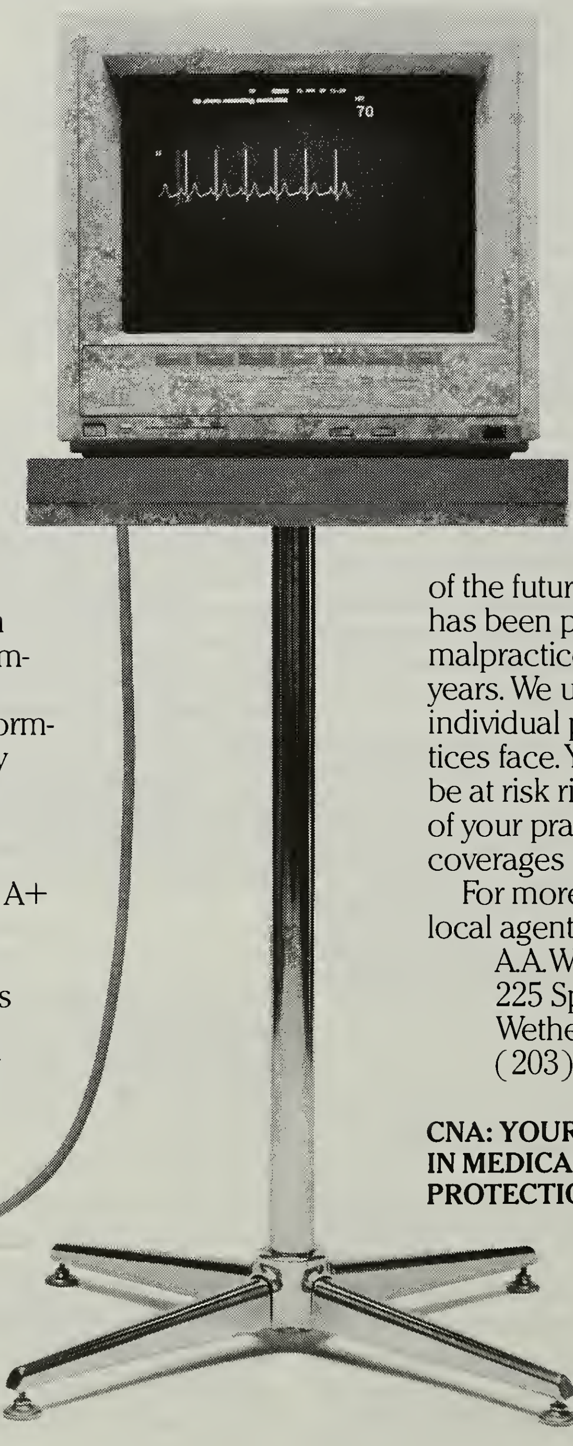

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Two Points of View

Health Care Coverage Needs Major Surgery

During the past three years, a group of physicians broadly representative of the medical community in the third congressional district met with U.S. Rep. Bruce A. Morrison to explore the problems and opportunities of the American health care system in this turbulent era.

We reviewed problems faced by health care providers, health care payers, our elected representatives, and, most importantly, patients.

General agreement was reached that:

- The medical profession and the American health care delivery system have experienced an extraordinary growth in their ability to treat or cure many major diseases and to palliate or modify many others;
- While doing so, our health care system has become unique in offering state-of-the art technology to a large number of people, coupled with flexibility, free choice, and an improving degree of patients' involvement and consent;
- Unfortunately, we are also virtually unique among the developed countries of the world in providing no insurance to millions, incomplete insurance to millions more, and in imposing significant bureaucratic delay and administrative expense upon the delivery of health care;
- Last, we grappled with the issue which seems to have dominated the public debate, namely the increasing cost of health care.

As we tried to address the problems, it became obvious to us that these conflicts could only be resolved by a system of universal insurance which preserves the favorable aspects of medical care in this country.

Our unavoidable conclusion led us to develop a list of goals for such a universal health care insurance system. In broad outline, these are:

- equal access for all persons;
- secure funding that is defended from the annual uncertainty of budget-making;
- freedom of choice for both patients and physicians in directing the care of individual patients;
- professional direction of patient care decisions, subject to review by peers.

Our goals were sent to organizations throughout the state. We solicited proposals from all for a system of health care insurance which would meet the goals. Among those contacted were the major components of the insurance industry, labor unions, consumer action groups, and business and industry coalitions.

The response was disappointing. Few chose to look beyond their own immediate concerns. Therefore, we have embarked upon an independent study of universal health care insurance systems which have been proposed in both the public and medical literature.

None of the systems we have examined so far is ideal.

Some propose the imposition of a two-tiered system, one tier for those with financial resources and one tier for those without. In many proposals, the uninsured and the under-insured would be assigned to an independent benefits system, Medicaid, which has been receiving less and less support from our society.

Historically, we have only given consistent support to programs that benefit us all, and have begrudged funding for programs directed at limited segments of our nation. Only a universal system might be supported by all.

Our current system, and some proposed models, still assign those who can afford insurance to a welter of conflicting and duplicative insurance entities whose structure imposes major administrative costs, confusion, and bureaucratic delay.

Other proposals we have reviewed envisioned a uniform universal system of health care insurance, but have left the funding of the medical care of the nation to the annual uncertainty of budgeting. This approach has led to the recent debacle which occurred with the national catastrophic health care insurance legislation and to Massachusetts' inability and/or unwillingness to fund its commitment to its uninsured citizens. To meet the health care needs of the American people reliably, stable budgeting on a long-term basis is necessary to maintain appropriate levels of research and development, technology assessment, and the entire infrastructure of health care. A universal health care insurance system ought not lead us to expect second-rate health care.

One inescapable conclusion we have reached and one which most, if not all, advocates of a universal health care insurance system have failed to face is that the implementation of such a system will require time and expense.

Thirty-one million persons in the United States are uncovered or poorly covered by health care insurance. Their medical needs will have to be met. In addition, converting from the current health care insurance system to a universal system would be a massive undertaking which, itself, is costly. Hence, a realistic approach should anticipate an initial increase in expense. It is in the long-term that we would expect to reduce the rate of increase in costs and to provide for rational growth in the health care system.

The public debate should also recognize from the beginning that systems in other countries will not necessarily work well in the United States. However, that America needs an American system should not deter us from examining others and from learning from their successes and failures.

John W. Blanton, M.D., John E. Fenn, M.D., Marvin I. Fox, M.D., Charles F. Hollander, M.D., Michael Kashgarian, M.D., Ernest D. Moritz, M.D., U.S. Rep. Bruce A. Morrison, Boris G. Rifkin, M.D., Morton H. Silberstein, M.D., Virginia M. Stuermer, M.D., Ulrich H. **Weil, M.D., Herbert E. Weisberg, M.D., and Steven Wolfson, M.D.**

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The Coming Push for National Health Care

Conservatives and free-marketeers across the country have cause to celebrate these days. For the first time in decades, Congress has eliminated a welfare-state program. Repealing the catastrophic care plan for the elderly has raised hopes that future spending sprees on health care will face insurmountable opposition in Congress. Health care experts, journalists, and broadcast commentators have advised that other forays by the government into health issues, such as mandated benefits, long-term or nursing home care, national health insurance, and nationalized health care are virtually dead in the water. *The Wall Street Journal* even remarked that this recent defeat has killed for now any further attempts to socialize American medicine.

Despite this remarkable success in rolling back one program, now is *not* the time for those who believe in free markets to relax. If current wisdom is correct, then the Bush Administration has a unique window of opportunity through which to propose major reforms to this country's ailing health care system, bringing it back into balance with our free-market convictions. The time may be right to urge significant changes that would curtail spiraling health care costs, making health care more affordable and offering citizens the chance to choose the way to provide for their own future health care needs.

The Administration must act now, for to wait may allow an opportunity to pass that might never come again. Those who believe government can best provide for our lives are already working behind the scenes for passage of a comprehensive national health care plan for *all* Americans—and their target date is 1990.

Calls for some kind of national health care program have increased during the past year and are coming from a variety of sources. The rapid escalation in health care costs, particularly in the 1980s, and attention to the fact that approximately 30 million Americans lack health care insurance, have raised demands for some kind of universal solution.

Not too surprisingly, the A.F.L.-C.I.O. used its national convention in November to kick off a major campaign for national health insurance legislation in the next Congress. However, what has amazed some are voices from the business community speaking out for more federal government involvement in health care. Ever-rising health care costs, due to government interference and a perverse system of incentives and controls,[1] have so frustrated American business leaders that some have now resigned themselves to failure and are asking the government to bail them out.

Art Puccini, vice president at General Electric, in a speech early last year, said, "rising employee medical costs may lead some of us who today are free-market advocates to re-examine our thinking and positions with respect to government-sponsored national health insurance." Ford Motor Company has been using its seat on President Bush's competitiveness council to push for government health care, and General Motors vice president Beach Hall has been seen at several recent Capitol Hill meetings on the issue.

Walter B. Maher, director of employee benefits for Chrysler Corporation, has urged that a national budget be set for health care each year—much like in Canada, Britain, and other countries with national health care plans. The Washington Business Group on Health, which represents about 180 Fortune 500 companies on health issues, is one of several groups drafting a national health care plan with the goal of controlling health-related spending.

Astonishingly, it's not just big business, frustrated with mounting health care costs, that is turning a favorable eye toward a national health plan. A recent Dun & Bradstreet survey of *small* business found that 38 percent favored some form of national health insurance. The Independent Business Federation says 15 percent of its members polled in 1989 would agree to a mandatory national health insurance program.

In addition to business, another unlikely group has joined the clamor for national health care: physicians. Last year, Physicians for a National Health Program, a two-year-old group of 1,200 doctors from across the U.S., proposed a single public insurance plan that would pay for all approved medical services. According to Dr. Arnold Relman, editor-in-chief of the *New England Journal of Medicine,* "Nothing short of a comprehensive plan is likely to achieve the goals of universal access, cost containment and preservation of quality that everyone seems to want."

Many experts believe that it is currently impossible to undertake a national health care program of any kind, because of federal budget deficits. Despite this, polls are showing that Americans see the deficit as less and less of a threat and that they are concerned about those who don't have access to health care because of its current high costs. Because of that concern, and if skyrocketing health costs are not slowed, some health care experts, such as Harvard University professor Robert J. Blendon, predict that national health care will become a major issue during the next few years.

Socialized medicine, the word normally used for a national care program, conjures up vivid images in most American's minds. One sees Soviet citizens dying because of a lack of adequate medical care, British citizens waiting for months to undergo a simple procedure or surgery, rich Europeans paying under the table to get their names pushed to the top of a waiting list, and Canadians hopping the border into the U.S. to have procedures done, rather than wait months or maybe years in their homeland.

No one, including most members of Congress, expects the American people to accept a socialized system like that of the Soviets, with its centralized control of every aspect of health care. Recent attention given to the severe problems besieging the British national health care system has prompted Prime Minister Thatcher to institute some market-based reforms and has turned proponents away from that example. However, many bills recently introduced in Congress would provide for a system of national health insurance modeled after the perceived success of the Canadian health care system.

One of the bills receiving the most attention is Senator Kennedy's "Minimum Health Benefits for All Workers Act." This bill would require all employers to provide health care insurance for workers and their dependents. Besides being a major intrusion by the government into individual and business decisions, the bill would increase health insurance costs by $100 billion, result in a loss of one million jobs, and spawn a further escalation in medical price inflation. One cannot overlook that mandated benefits are really transfer payments in disguise, with all the pernicious economic consequences of such transfers. A study by the National Center for Policy Analysis estimates that as many as 25 percent of the uninsured lack health coverage because current state-mandated benefit laws make it too expensive.

Governor Michael Dukakis has been touting his new Massachusetts universal health insurance program as a model for the nation, and politicians in some states have believed him. Under the Massachusetts program, all companies with more than five employees that don't provide insurance are required to contribute as much as $1,680 a year for each employee to a pool providing health insurance to people without coverage. Interestingly, a year after the plan has gone into effect, it is facing severe budget shortfalls, and hospitals and businesses are concerned they will be left footing the bill for skyrocketing costs.

Many politicians have praised the Canadian system of health care as successful in providing satisfactory health care at lower costs than the United States. But the problems inherent in any health system based on social insurance or direct government funding are already showing up in the Canadian program. These endemic flaws should give pause to U.S. lawmakers eager to adopt a plan similar to the Canadian one.

The underlying problem with any social insurance system is that patients make little or no contribution to the cost of their care. What follows is the exorbitant increase in the demand for health care services, and the resulting price controls, rationing, income controls on physicians, shortages of equipment, deterioration of medical facilities, and long waiting lists. Canada has exhibited all of these symptoms, and many Canadians routinely cross the border into the U.S. for treatment. Price controls, rationing, and waiting lists do put a lid on health care spending, and that is exactly why many politicians can boast that Canada spends less on health care than the United States. But is that quality of health care Americans want?

As mentioned above, a unique window of opportunity may exist in Washington following the collapse of the catastrophic health care legislation. Now is the time to reverse the trend toward nationalizing our health care system and replace it with a free market. The creation of Medicare and Medicaid in the 1960s, their continued expansion, and the addition of a crazy quilt of health care programs by both the Federal and state governments have virtually destroyed Americans' access to reasonable and efficient health care.

Government intervention has our health care system caught in a vicious cycle of government-encouraged demand that drives up costs, bankrupts federal and state budgets, and leads to still more infusions of money and program expansions that encourage additional consumption. Only the elimination of government interference and a return to a free market in health care will end the move toward nationalization. Only a free market will break the spiral of ever-increasing medical costs. As Ludwig von Mises wrote, "The pricing process of the unhampered market directs production into those channels in which it best serves the wishes of the consumers as manifested on the market."[2] Only a free market in health care will allow individuals maximum choice in meeting their health care needs.

Terree P. Wasley

Terree P. Wasley *is a Washington-based economist and free-lance writer who has worked on tax and health care issues for the U.S. Chamber of Commerce, the Goldwater Institute, and The Heritage Foundation.*

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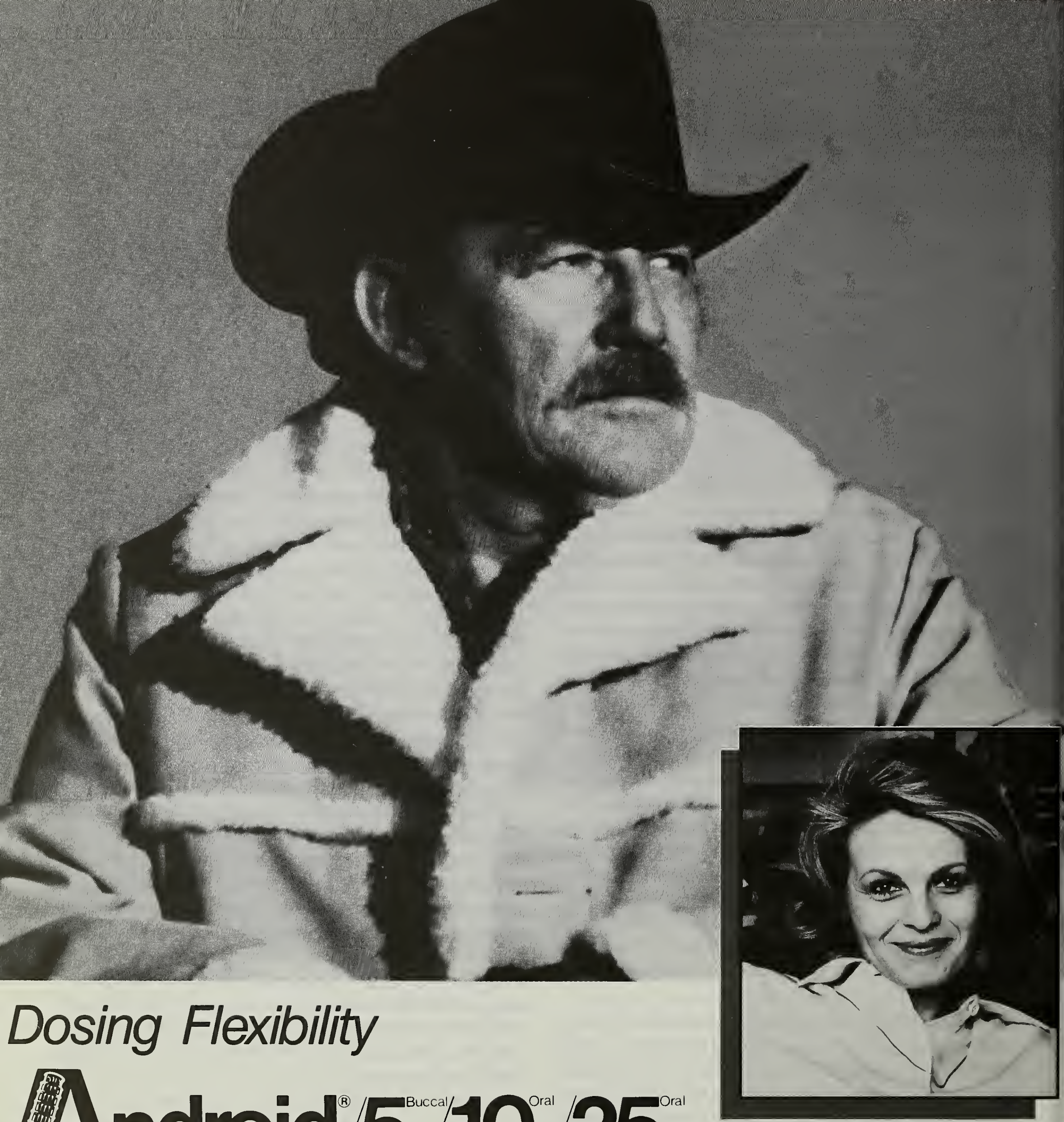

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Access to Care

Early this month the American Medical Association released *Health Access America*, a proposal to improve access to affordable, quality health care. About the same time the Pepper Commission, a federal commission chaired by Senator John D. Rockefeller IV, recommended that all Americans be provided with health insurance within five years. Let's look at the two programs:

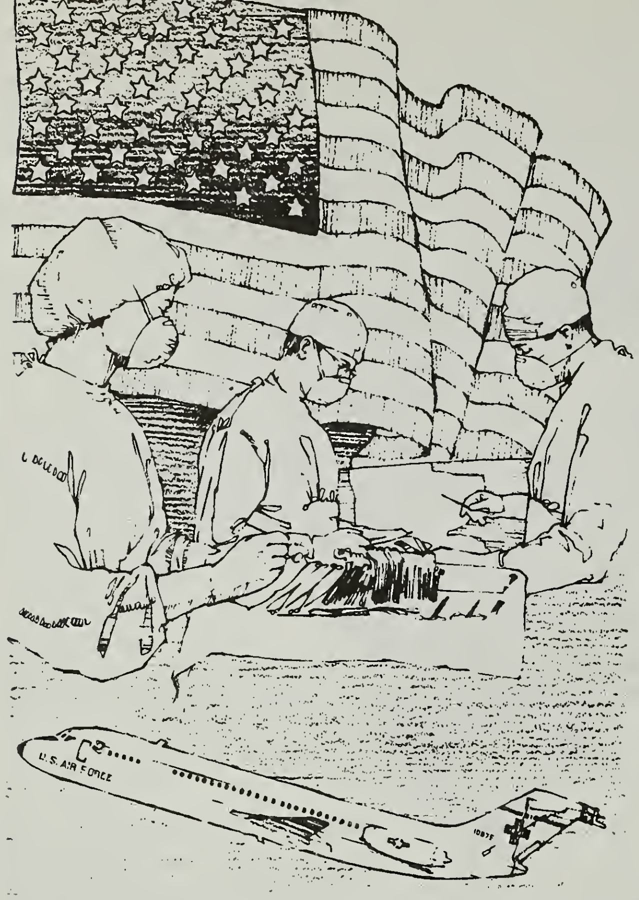
The AMA proposal, *Health Access America*, is based on these fundamental principles—improvements to the American health-care system should preserve the strengths of our current system; affordable coverage for appropriate health care should be available to all Americans, regardless of income; particular efforts are needed to assure continued access by the elderly to affordable health-care services; health-care services should be provided with high quality at appropriate costs; patients should be free to determine from whom and the manner in which health-care benefits are provided; and all physicians should be committed to the highest ethical standards in caring for their patients. To accomplish the goal of affordable health care for all, the AMA has listed sixteen points. Among these points are several which require major change—Medicaid reform to cover all persons below the poverty level with national requirements and a uniform set of benefits; employers' provision of health insurance with appropriate tax incentives; state risk pools for the medically uninsurable; Medicare reform to assure a financially sound program; long-term care financing through the private sector; professional liability reform; and the development of practice parameters.

The recommendations of the Bipartisan Commission on Health Care created by Congress in 1988 (Pepper Commission) would bring health care coverage to the 37 million uninsured, extend federal control over some programs, and provide care for the chronically ill. Major changes in our present health-care delivery system would be necessary. The Medicaid program would become a federal program instead of a combined federal/state enterprise. Employers would be required to insure at least 80% of their employees within five years. Medically uninsurable people would be covered in community-rated insurance programs. Those below the poverty line would be guaranteed immediate access. The development of programs for nursing home care for the elderly with low and moderate income and those with severe disabilities would be a top priority.

There are, of course, similarities and differences in the two approaches. Both address the need for people below the poverty line to obtain health care through a strengthened Medicaid program. There would be an expansion of employer-based insurance programs for workers. Government involvement as an insurer of last resort, and methods for insuring long-term care for the chronically ill are part of each proposal. As might be expected, the AMA proposal leans more heavily on the private sector while the Pepper Commission suggests the need for more government control. The Commission approach carries an estimated price tag of $86.2 billion dollars. No doubt, the AMA proposal would be as expensive. The cost alone may doom these proposals to defeat. Coupled with the politics associated with consideration of health-care issues in Washington, there appears to be little chance of immediate legislative change.

However, these proposals, one from the medical profession and the other from a government commission, raise hope that, perhaps, there is enough common ground that continued discussion among the many vitally interested parties—consumers, government, medical professsion, insurers, employers, and labor—may, in the long run, bring better health care for all of us.

Roger S. Beck, M.D.
President



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A GREAT WAY TO SERVE

John Henry Newman

1801-1890

ROBERT U. MASSEY, M.D.

My first reading assignment in freshman English at Oberlin, over a half century ago, was John Henry Newman's *The Idea of a University*, probably only three of the Discourses, "Knowledge its Own End," "Knowledge Viewed in Relation to Learning," and "Knowledge Viewed in Relation to Professional Skill." Since much of the remainder of this work deals with teaching and learning in a Roman Catholic university, and since Oberlin's roots were in the liberal Protestant tradition, only the chapters on liberal education would have been chosen. At the time I may have recognized Newman as the author of the hymn "Lead, Kindly Light," number 430 in the Episcopal hymnal, but otherwise knew little about him; our class discussions of his discourses on university teaching made a lasting impression, and years later at the urging of a fellow medical student I read his *Apologia pro Vita Sua*. It affected me more than I had anticipated, and I have continued an interest in the lives of the men involved in the Oxford Movement, Pusey, Keble, Froude, and, of course, Newman. I reread *The Idea of a University*, or most of it, along with Jacques Barzun's *The American University*, when I undertook new responsibilities in academic administration 19 years ago. These two, with Alfred North Whitehead's *The Aims of Education*, became not constant but frequent companions. So much for that.

Cardinal Newman, whose life spanned almost the entire 19th century, died 100 years ago this year; in many ways he seems the antithesis of what we think of that century with its remarkable developments in science and technology, and its flowering of the of the clinical and basic sciences in medicine. Indeed, much of 20th century science has been but an elaboration of work well begun in the 19th. We have grown accustomed to our view of the Victorian century of progress, and are surprised to find Newman poking around in it (he actually refers once to taking the train down from Oxford), but we should not be, for he is clearly within its traditions. Lytton Strachey devotes almost one fourth of his biography of Cardinal Manning to his nemesis, Cardinal Newman, this "... one figure which, by virtue of a peculiar eminence, seemed to challenge the supremacy of his own." He was indeed an eminent Victorian! "Dr. Newman is the most dangerous man in England," wrote one of Manning's advisers.

In *The Idea of a University* he reminds us that in some way all knowledge is a unity, "...that the various sciences, which occupy the field of Knowledge, have, not mutual relations only, but run toward and into each other, and converge and approximate to a philosophical whole,..."

He insists that knowledge, liberal and philosophical, in which he includes the sciences, is its own end, its own reward:

> What the worth of such an acquirement is, compared with other objects which we seek, —wealth or power or honour or the other conveniences and comforts of life, I do not profess here to discuss; but I would maintain, and mean to show, that it is an object in its own nature so really and undeniably good, as to be the compensation of a great deal of thought in compassing, and a great deal of trouble in attaining.

That liberal education has a kind of indirect utility, he does not deny. He writes, "But a University training is the great ordinary means to a great but ordinary end;..." Newman concludes Discourse VII with perhaps the most often quoted lines in this work:

> (This education or training) teaches him to see things as they are... It prepares him to fill any post with credit, to master any subject with facility... He has the repose of mind which lives in itself, while it lives in the world, and which has resources for its happiness at home when it cannot go abroad. It has a gift which serves him in public, and supports him in retirement, without which good fortune is but vulgar, and with which failure and disappointment have a charm. The art which tends to make a man all this, is in its idea as useful as the art of wealth or the art of health, though it is less susceptible of method, and less tangible, less certain, less complete in its result.

Our age would call this elitism, but that can be dismissed; perhaps the classical education that John Henry Newman had in mind would not entirely suit these latter days of the 20th century, but we dismiss Newman's *Idea* at our peril.

ROBERT U. MASSEY, M.D., Professor, Division of Humanistic Studies in Medicine, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington.

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LAW, MEDICINE AND PUBLIC POLICY

Judge Young and the Legal Status of the Human Embryo

JOSEPH M. HEALEY, J.D.

The decision of Judge W. Dale Young in the recent Tennessee case of *Davis v. Davis*,[1] described in my last column, is disturbing for several reasons. First, the basic question presented to the Court for its consideration was the disposition of seven cryogenically frozen embryos. It was unwise and unnecessary for Judge Young to take upon himself the imposing task of first determining when human life begins. Second, even if such an undertaking were deemed necessary or desirable, the conclusion reached by Judge Young represents a position at odds with existing law, the recommendations of major international commissions, and the testimony of the vast majority of the experts who testified at trial. Finally, even if one were to accept the value or necessity of his conclusions, he failed to apply them in an appropriate manner in the resolution of the case itself. For these reasons, it seems unlikely that his decision will escape at least partial reversal during appellate review.

Few questions have provoked as long, as bitter, or as ultimately unsatisfying a public debate as has the legal and ethical status of the human embryo or fetus. There are at least four contexts in which this discussion has taken place: abortion, civil and criminal liability for prenatal harms; fetal experimentation; and the use of new reproductive technologies. In each case, despite years of attempts to convince or persuade those who hold differing views, women and men of good conscience continue to disagree and the likelihood of achieving consensus remains remote. By seizing upon this question as his starting point, Judge Young pursued a line of inquiry which only led him into deeper trouble. As Professor George Annas has pointed out:

> For reasons he never explains, and that may be more related to the media value of the case than its fair resolution, the judge framed the central issue not as who should get the embryos, but rather whether the embryos were people or products. This, of course, is *not* an outcome-determining categorization (since either way, the question of who gets them remains). Moreover, stating the question in this way is very misleading: embryos could just as easily be considered *neither* products nor people, but put in some other category altogetherr. There are many things, such as dogs, dolphins, and redwoods that are neither products nor people. We nonetheless legally protect these entities by limiting what their owners or custodians can do with them. Every national commission worldwide that has examined the status of the human embryo to date has placed it in this third category: neither people nor products, but nonetheless entities of unique symbolic value that deserve society's respect and protection. By setting up a false dichotomy, the trial judge doomed himself from the outset to write an unsound opinion. This structural mistake led to a more serious error.
>
> The judge believed it was up to him to decide whether or not embryos were people. With a rare combination of hubris and ignorance the trial judge, interviewed after his decision was issued, said the U.S. Supreme Court had "ducked" this issue in *Roe v. Wade*, but that he had to decide it. Nor did the method he chose to decide whether embryos were people bring much credit to the judiciary: he decided to rely exclusively on the testimony of one witness, French right-to-life physician Jerome Lejeune.[2]

Determining the legal and ethical status of the human embryo/fetus is a complex undertaking rooted in four separate though related controversies and reflected in long-standing policy debates. By ignoring this complexity and attempting to implement a simplistic solution to a question that did not have to be asked, Judge Young has only complicated the process of determining how the seven frozen eggs should be handled by the Court.

Discussion of this case will conclude in next month's column.

JOSEPH M. HEALEY, J.D., Associate Professor, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington, CT.

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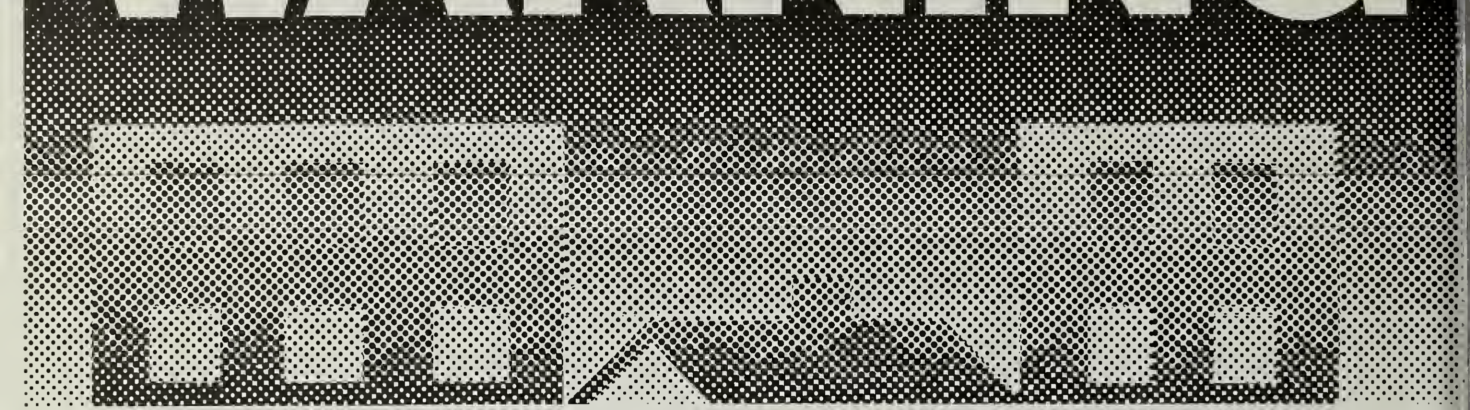
1. Fifth Jud. Ct, Tennessee, E-14496, 1989 September 21 (Young J).
2. Annas G, A French homunculus in a Tennessee court, *Hastings Cent Rep* 1989;19,6:20-1.

WARNING



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50 Years Ago

From the *Journal of the Connecticut State Medical Society*

March 1940

THE PRESIDENT'S PLAN FOR NEW HOSPITALS

Only a few months ago lending his support to compulsory health insurance and to such legislation as the Wagner health bill, President Roosevelt has now openly declared himself possessed of a complete change of heart and in favor of the construction of fifty new hospitals instead of any plan for compulsory health insurance. The reasons for his sudden shift of purpose may never be made known but we suspect that the powerful influence of the Editor of the Journal of the American Medical Association has reached Presidential ears. At all events, the drive for compulsory health insurance is bogging down. In a poll recently conducted by the Christian Science Monitor it was discovered that thirty-three members—more than one-third of the total number of the United States Senate are prepared to commit themselves against compulsory health insurance. As the Monitor says, "when any opposition movement starts with a nucleus of one third of the Senate members ready to pledge themselves, it would appear to be an insuperable bloc, unless or until conditions and circumstances alter basically."

But what of the plan for the construction of fifty new hospitals to be financed by a Congressional appropriation of $7,500,000 to $10,000,000? The President made this proposal on his birthday anniversary and one of his secretaries sentimentally called it "the President's contribution to the nation."

As the Editor of the Hartford Courant recently expressed himself, commenting on this proposal, "it costs very little to contribute an idea, but unfortunately its adoption may entail unexpected consequences." The same Editor is quite skeptical of the whole idea and warns Congress, that before it adopts the President's recommendation it ought to make very sure that the program, so attractively presented, is thoroughly practical.

During his address before the mid winter dinner meeting of the State Medical Society the dynamic Doctor Fishbein cited several instances where hospitals had been built by federal agencies at enormous costs, in isolated localities evidencing little if any need for any new hospital, and without any provision for maintenance. The $10,000,000 called for by the President would scarcely suffice to maintain these fifty new hospitals, this again must be left to the long suffering tax payer or the isolated philanthropist in that geographical sector who has managed to survive the frequent demands for taxation. Undoubtedly the entire proposal would be an experiment, as the President expressed it, "in the sense that the nation will gain much experience by undertaking such a project," but, like the Emergency Relief Administration and other projects of the New Deal, the cost of such an experiment would not be small.

Should Congress wish to appropriate $10,000,000 to hospital construction it would do better to place this sum where hospital facilities already exist and need increasing to meet local demands, reserving its construction program only for areas which can be proven to be in actual need of such construction and able to carry on the maintenance of new hospital facilities. It is one thing to build, as the President outlines, "simple functional structures, utilizing inexpensive materials and construction methods;" it is quite another problem to place these new buildings where local needs really exist, to staff them with physicians of the best type according to standards established by the American College of Physicians, the American College of Surgeons and the American Medical Association, and to maintain them in an economic and efficient manner.

—Editorial probably by Dr. Stanley B. Weld.

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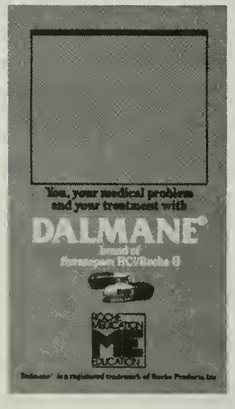
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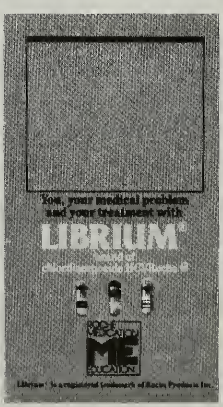
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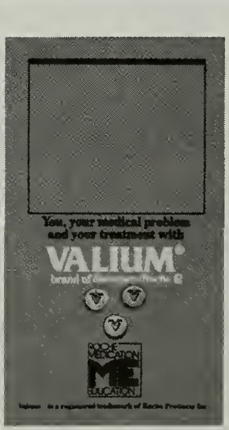
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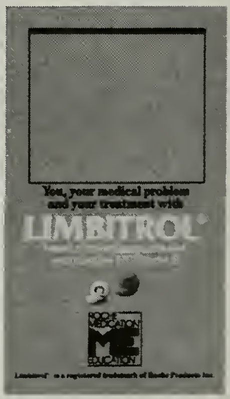
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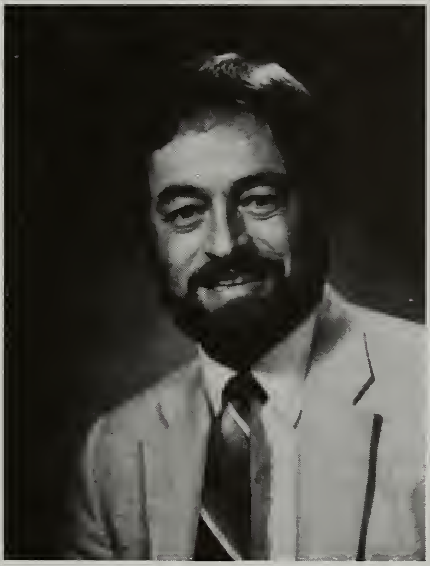

Robert J. Smith

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Letters to the Editor

Letters to the Editor are considered for publication (subject to editing and abridgment), provided that they are submitted in duplicate, signed by all authors, typewritten in double spacing, and do not exceed 1½ pages of text (excluding references). They should not duplicate similar material being submitted or published elsewhere. Letters referring to a recent *Journal* article should be received within six weeks of the article's publication.

MORE ON PODIATRIC AND ORTHOPEDIC SURGERY

To the Editor: I have been following the "Letters to the Editor" section in *Connecticut Medicine* for a couple of months now regarding the initial surgery by nonsurgeons article written by Dr. John C. Russell, Chief of Surgery, New Britain General Hospital. I feel compelled to comment on the letter to the editor written by Jeffrey F. Yale, D.P.M., in the December 1989 issue. I must take issue with Dr. Yale's contention that podiatric medicine's specialized medical school education plus one to three years of surgical residency results in a far superior background in the lower extremity biomechanics and foot surgery than a three-year general orthopedic residency. This contention is erroneous primarily because no orthopedic residency escapes in-depth issues of foot medicine and foot surgery. Requirements regarding education in this area are stringent and a significant volume of questions both in-training exams and board examinations are aimed at testing one's knowledge in foot biomechanics, ankle biomechanics, ankle and foot surgery, and ankle and foot medical care in general.

I am sure that Dr. Yale is aware of the fact that there are numerous foot and ankle postgraduate training courses available as well both in specialized courses and in the fellowship realm. It is also possible for one doing a standard orthopedic residency to concentrate in an area of interest in residencies that do have elective time.

I would agree with Dr. Russell that the Medicare annual data are impossible adequately to analyze since a number of these procedures might be procedures that orthopedic surgeons would not normally charge for and therefore would not be included in the annual Medicare data studies.

In terms of peer review, it is indeed important that podiatric and orthopedic surgeons come under similar scrutiny regarding surgical procedures primarily, in my opinion, in the area of surgical indications for surgery. There has been concern at our hospital about the general aggressiveness of podiatric surgery and how adequately to obtain good peer review regarding both the necessity of surgery and the quality of surgery performed. These are current areas of ongoing discussion within our own department.

The Connecticut State Medical Society does indeed have a Committee on Allied Health which seeks to encourage communication between podiatrists and orthopedic surgeons. Hopefully meaningful dialogue and productive discussion regarding these issues can continue.

Danbury F. Scott Gray. M.D.

To the Editor: When all the rhetoric about orthopaedic surgeons *vs* podiatrists is exhausted, a few clear facts still remain unchanged, that is:

1. Admission requirements to podiatry school are still inferior to those of medical school. I recently reviewed the admission requirements of the seven podiatry schools in the United States. The grade point average for admission ranged from a low of 2.7 to a high of 3.1. No one gets into medical school with a grade point average less than 3.5.

2. A medical school experience cannot be compared to the experience in a podiatric school. There is no doubt, that courses such as anatomy, physiology, and biochemistry are taught in podiatric schools, but the scope and intensity of such courses are much less in podiatric school given the ultimate limited use for them. Moreover, the extensive total body experience of a medical student during his clinical years far out weighs that of a podiatric student.

3. Orthopaedic interns and residents are exposed to the entire gamut of human disease. An orthopaedic resident not only diagnoses myocardial infarction, conjestive heart failure, and diabetes, but also actively treats such conditions with drugs such as digitalis, lasix, insulin, thereby gaining first hand experience and responsibility for the whole patient. The same cannot be said for a podiatrist. An orthopaedic resident also attends foot clinic weekly and he is responsible for the diagnosis as well as the conservative and surgical treatment of all foot cases that go through the hospital, both from private orthopaedic surgeons and from the full-time staff.

4. Since I have a special interest in the foot, I read both the podiatric and the orthopaedic literature. I am always impressed by the fact that most articles in the podiatric literature are anecdotal. Very few are controlled, double-blind studies. In addition, most of the bibliography in these articles comes from the orthopaedic literature.

5. In preparing a patient for surgery on the foot, an orthopaedic surgeon does his own examination of the entire patient. He does not depend on someone else to do the physical exam. When an orthopaedic surgeon operates on a foot, he brings his knowledge of the entire human being to bear on that foot surgery. Moreover, he is able to handle any emergency that may come his way, including doing a tracheostomy, or "cracking the chest" if need be. Patients should bear in mind that surgery by a podiatrist often means that there is no MD in the operating room, (anesthestist-podiatrist). The "consulting internist" is safely in his office. In case of an emergency, one has about four minutes to save a patient's life.

Finally, I agree that lines of communications between orthopedic surgeons and podiatrists should remain open, and a healthy dialogue should exist, but MDs should keep in mind that podiatrists are not "foot specialists" as they would have us believe, but rather "limited practitioners."

Hamden Enzo J. Sella, M.D.

From the Executive Director's Office

CALL
ANNUAL MEETING OF THE HOUSE OF DELEGATES

The 1990 Annual Meeting of the House of Delegates will be held at the Ramada Inn, 275 Research Parkway, Meriden. The meeting will commence at 10:00 A.M. on Wednesday, May 9th, and will continue until all business has been concluded.

9:30 Registration and Continental Breakfast
10:00 Call to Order

Roger S. Beck, M.D., President
Kenneth M. Robbins, M.D., Speaker of the House
Marjorie G. Petro, M.D., Secretary

INTRODUCTION OF RESOLUTIONS

Article V, Section 12, Par. 3 of the Bylaws of the Society provides that:

Resolutions may be introduced by any Active, Life Member, Student Member or Postgraduate Physician Member of The Society, in compliance with the following provisions.

a. All resolutions, reports and similar items of business submitted in writing and received at the office of the Executive Director not later than thirty days before the date scheduled for that meeting shall be considered as regular business of the House of Delegates.

b. Component county associations or the Student Member or Postgraduate Physician Member Associations whose meetings are held later than thirty-five days prior to the date of the House of Delegates shall be allowed five days after the close of such meeting in which to submit resolutions, reports and similar items of business to the Executive Director's office and still have such material considered as regular business. In no event, however, may such resolutions, etc., be considered regular business if they are received later than fifteen days prior to the date of the meeting.

c. Reports, recommendations, resolutions or other new business may be presented to the House of Delegates by the Council of The Society at any time and shall be considered as regular business.

d. Any business which does not qualify as regular business in accordance with the foregoing provisions may be accepted for consideration by a majority vote of the delegates present and shall be referred at once by the Speaker to a reference committee. When business is introduced under the provisions of this paragraph the vote shall be taken without debate, except that the introducer shall be allowed not more than two minutes to explain why it should be considered as regular business.

COUNCIL MINUTES

Thursday, February 22, 1990

Attendance

Present in addition to the Chairman, Dr. Joseph C. Czarsty were Drs. Beck, Blum, Dardick, Eslami, Freedman, Kamens, Keating, McDonnell, Orphanos, Parikh, Petrie, Redmond, Reyelt, Jr., Sadowski, Sosa, Wetstone, Zanker, Zeppieri, and Zlotsky.

Also present: Mr. Norbeck, Mrs. Lindquist, Mr. Brunell, Mr. Garofalo, Ms. Ballou, Mr. Conway (FCMA), Ms. DeLaura (HCMA), Mr. Freberg (NHCMA), and Mrs. David Reed (President, Auxiliary).

Absent were: Drs. Ahamed, Bobruff, Bonner, Brooks, Chmieleski, Fox, Franklin, Hollister, Kaufmann, Lesnik, Meridy, Petro, Robbins, Rose, and Welch.

Remarks of the Chairman

Raymond T. Sullivan, Jr., CSMS Director of Public Affairs.

Dr. Czarsty requested the Council members to stand for a moment of silence in memory of Raymond T. Sullivan, Jr., who died suddenly on January 23, 1990.

Health Care Costs

The Chairman expressed the appreciation of the Council to Tim Norbeck, CSMS Executive Director, for the article he wrote entitled "Telling the Truth About Rising Health-Care Costs" which was published in *Private Practice,* a national magazine, as the cover story.

New Associate Councilor

Dr. Czarsty introduced Dushyant B. Parikh, M.D., Enfield, who was attending his first Council meeting as Associate Councilor from Tolland County.

Reports on Related Organizations

CPRO: Dr. Kamens reported that a representative from the Health Care Finance Administration (HCFA) personally came to Connecticut for the contract renewal of CPRO and to inform them that CPRO was one of the top three PRO's in the country.

He further reported that Medicaid wished CPRO to inform physicians that Medicaid is an insurance program and will be treated as such. As an insurance program it has very specific qualifications and coverages. One of the policies which they wished stressed is that when patients are transferred back and forth between hospitals, unless it is clearly documented that there is a medical necessity for those transfers, there may be some coverage problems. Also transfer of patients outside the state for various procedures must be clearly documented and justified.

As to the quality of care issue, it was reported that over the past six months there were over 60,000 hospital admissions, and approximately 20,000 individual chart reviews, and that the number of problems noted was minimal and they are being addressed properly.

Dr. Kamens also reported that recently questions have been referred from Medicare concerning the use of certain drugs, primarily in oncology, for indications which, at the present time, are not clearly appropriate. Medicare (Part B) usually evaluates payment decisions on new or unusual coverage issues by referring these questions to the Physician Data Query (PDQ), which usually lists standard and experimental treatment protocols. On occasion, Medicare (Part B) noted that physicians are using medications for unlabeled indications in hospital settings. It was stated that this issue may more appropriately be addressed by CSMS Hospital Medical Staff Section (HMSS). It was voted to refer the following questions to the HMSS:

(1) Should patients treated with approved protocol drugs be treated only at hospitals involved in a protocol?

(2) Should a specific mechanism (committee, etc.) in the hospital be involved in evaluating the use of any drug not specifically labeled as appropriate for the specific disease being treated and should the committee approval be required before the drug is used for that specific condition?

Dr. Kamens reported that Gerald Blank M.D., Medical Director of Medicare (Part B) is interested in the CSMS position and would be pleased to discuss the matter with the HMSS.

CMMI: Dr. Eslami reported that at recent meetings of the Boards of CMMI and CMIC, the subject of CMIC moving their headquarters to Glastonbury was discussed. The move is necessary due to the growth of the organization and the need for additional space. He also reported that CMIC is in the process of putting new products on the market, one of which is professional liability insurance with a sizable deductible. This product would be primarily of interest to physicians in group practice. Another product being developed is "slot" insurance which would be available to HMO/IPA groups, emergency rooms, etc., whereby groups would be covered. It was noted that each individual who fits into a "slot" would have to meet the standard underwriting criteria and be credentialled appropriately.

Report of the President

Dr. Beck reported on the following activities:

(1) He attended a meeting with the Connecticut Citizens Action Group (CCAG) in which the whole theme of the meeting was Canadian style health care. The attendance was approximately 200 and the speakers represented the inner city health centers, the disabled and their problems accessing health care, and problems of prenatal care and infant mortality. Each of the speakers represented that the solution to their problems was additional funds.

(2) He has met at various times with representatives of CBIA, Workers' Compensation Commission and the Connecticut Bar Association at which time problems of mutual interest were addressed.

(3) He attended the Sportsmed Symposium where he introduced Commissioner Fred Adams, who was the keynote speaker. At another time, a private meeting was held with Commissioner Adams, Tim Norbeck and Kyle Ballou at which time the Commissioner discussed a program to address the health care needs of the Hispanic community. Dr. Adams has agreed to address the CSMS House of Delegates meeting on May 9, 1990.

(4) A meeting was also held on the nurse practitioner rules and regulations and Dr. Beck asked Dr. Brooks to report on this issue. Dr. Brooks reported that the committee continues to meet and officially the law went into effect January 1, 1990 but implementation of the law has been held up because the state has not given any money to the State Department of Health for personnel required to enforce the law. He stated that there are still many issues to be resolved in forthcoming meetings.

(5) Dr. Beck reported that based on a survey made of the 25 CSMS sections, only five sections indicated their willingness to meet on May 10th and of those meeting, all were meeting after 2:00 p.m., therefore, it was recommended and VOTED that no general luncheon or exhibits would be held on that day. For those sections planning to meet, CSMS staff will arrange for meeting rooms and publish the programs in the Journal. The subject of the future of section meetings was referred to Dr. Kamens, who has already been assigned the task of making a study of the feasibility of continuing the general scientific program.

Report of the Executive Director

Mr. Norbeck introduced Marc Garofalo, who is filling the position of Director of Public Affairs, which was left vacant by the sudden death of Raymond Sullivan, Jr. Mr. Garofalo began employment on February 19th.

Mr. Norbeck reported that *Medical Economics* will be coming out with a terrible article on the AMA entitled "Rocking the AMA." Most physicians are aware of the recent problems at the AMA. The Executive Vice-President, James Sammons, M.D., has resigned as of February 9th and in the interim period, the Deputy Executive Vice President, James Todd, M.D., from New Jersey, will act as the EVP.

A search committee has been formed and it is hoped to fill the position by fall. The AMA has rebutted some of the articles printed in the various newspapers, but to date no rebuttals have been published.

Report of the Auxiliary

Mrs. Joan Reed, President, reported that as a result of a poll it was decided not to sponsor a seminar on "Medical Marriages and/or Families" because of lack of enthusiasm. At the last Council meeting members were asked to give some thought to ways to promote the Auxiliary.

To date, Mrs. Reed reported that she has not received any suggestions. Dr. Czarsty asked the Councilors to give the matter serious thought and to send their suggestions to Tim Norbeck by March 5th, when the next meeting of the Auxilliary will be held.

M.D. Health Plan Loan

Guy W. Van Syckle, M.D., Medical Director, and Alex Sommers, Controller for M.D. Health Plan, joined the Council to discuss amendments to the Connecticut Savings Bank Loan to which CSMS is a guarantor. Dr. Van Syckle stated that the changes requested in the wording of the loan were requested by the insurance commissioner and that it was his understanding neither decreased or increased the risk of CSMS as guarantor of the loan. Mr. Sommers explained in detail as to the exact nature of the change and also stated that the bank felt it was an insignificant modification. In a communication received from the CSMS counsel, the opinion was rendered that "the amendment does not significantly change the level of risk or obligation for the Medical Society. Even if the Medical Society were successful in contesting the deletion of the right of set-off, its own obligations would remain unchanged."

Mr. Sommers further reported that M.D. Health Plan has been in the black and that it is anticipated that the loan would be paid off by the end of 1990. Dr. McDonnell, Treasurer, asked Mr. Sommers if he would send CSMS a note outlining M.D. Health Plan's intention of paying off the loan by the end of 1990, and Mr. Somers agreed to do so.

Following lengthy discussion, it was voted to endorse the amendment to the M.D. Health Plan Loan, with one abstention.

Dr. Van Syckle reported that growth continues to exceed the expectations and that by the end of January there were 31,500 members as compared to 9,000 last year. There are now 2,350 physicians in the Plan and the network is continuing to grow. He reported that financially they have stayed under their budget, and projections have stayed on target and, in the main, physicians have been very supportive.

International Association of Industrial Boards and Commissions

Dr. Zeppieri informed the Council that he had been invited to join the subject organization and to participate in its medical committee as a consultant. He reported that this stemmed from the work that was done with our Disabled Worker Committee in Connecticut. Dr. Zeppieri stated that if the Council agreed that organized medicine should have a representative within this organization, he would accept the position on behalf of the Connecticut State Medical Society and would ask CSMS to fund the cost of membership and attendance at meetings. It was VOTED to approve Dr. Zeppieri's request and sponsor his membership in the organization for a period of two years. It was further suggested that AMA be contacted to ascertain whether there would be any conflict of interest by this action since this would be national representation.

Pre-Admission Certification

The issue of third party payors seeking information on patients for hospital pre-admission certification and what guidelines should be followed in divulging the facts of a case to these entities was raised at the last Council meeting and staff obtained the following information. "All third party payors should be told that they must obtain a release from the patient for the physician to be able to divulge any facts of a case." It was VOTED to receive this report as information.

CSMS Charitable Trust

A communication was received from Wiggin and Dana outlining certain actions to be taken by the Council regarding the Charitable Trust, which are as follows:

(a) Confirm the appointment of the Trustees.

(b) Establish classes of various Trustees: (each class should consist as nearly as possible, of one-third of the total number of Trustees.)

Class I—One Year
Class II—Two Years
Class III—Three Years

Thereafter, Trustees shall serve for a three year term.

(c) Approve the minutes as drafted.

It was VOTED to confirm the appointment of the following Trustees and the terms as indicated beside their name:

Class I—One Year

(F) Bertram Grossman, M.D., 149 East Ave., Norwalk 06851

(H) R. Leonard Kemler, M.D., 1000 Asylum Ave., Hartford 06105

(M) Vincent J. Catrini, M.D., 520 Saybrook Rd., Middletown 06457

(NH) David Silverstein, M.D., 5 Maple Ave., Derby 06418

Class II—Two Years

(L) George Rubin, M.D., 200 Kennedy Dr., Torrington 06790

(NL) Thomas L. Lesnik, M.D., 119 Lafayette St., Norwich 06360

(W) Edward Sawicki, M.D., 90 Quarry St, Willimantic 06226

(Councilor) Howard J. Wetstone, M.D., 80 Seymour St., Hartford 06102

Class III-Three Years

(T) Virginia Riggs, M.D., 15 Palomba Dr., Enfield 06082

(H) Roger S. Beck, M.D., 30 Dale Rd., Wethersfield 06109

(Exec. Dir.) Timothy B. Norbeck, 160 St. Ronan St., New Haven 06511

(Councilor) Joseph C. Czarsty, M.D., 314 Main St., Oakville 06779

(Councilor) Turpin Rose, M.D., 16 Hospital Ave., Danbury 06810

Report of Subcommittee on Preliminary Study of Nominations

With a few amendments, and the tabling of the nominations of the CMMI Board of Directors until the April Council meeting, it was VOTED to approve the report of the subcommittee and to transit the slate of nominees to the House of Delegates for election with the Council's recommendation for approval. It was further VOTED to increase the Committee on Geriatrics to 12 members and to disband the Committee on Hospitals.

Report on Valuecare

It was VOTED to receive, as information, a report submitted by Jerome Freedman, M.D., on a meeting on Valuecare at the New Haven County Medical Association on February 1. He reported that it appears that the idea has attracted serious interest on the part of corporation leaders in the state.

CSMS Bylaw Amendment

It was VOTED to approve and transmit the following bylaw amendment to the House of Delegates, where it will be placed on the table for future action:

Article XII, DUES; Section 4, Delinquency

(Deletions in brackets and capitals)

Par. I — An Active Member is delinquent if his dues are not paid by April 30th of the year for which dues are prescribed and shall forfeit his Active Membership in the Society if he fails to pay the delinquent dues within thirty days after notice of his delinquency has been mailed to his last known address by the Executive Director of the Society. (ACTIVE MEMBERS OF THE SOCIETY WHO HAVE BEEN DROPPED FROM THE ACTIVE MEMBERSHIP ROLL FOR NONPAYMENT OF DUES CANNOT BE REINSTATED UNTIL SUCH INDEBTEDNESS HAS BEEN DISCHARGED, BUT SUCH INDEBTEDNESS SHALL APPLY ONLY TO THE ONE FISCALL YEAR OF DELINQUENCY.

Committee on Public Health

The Commitee on Public Health presented a detailed report on trauma deaths and injuries in which it was stated that trauma is a primary indicator of alcohol and drug addiction as an underlying condition. Peter O. Rostenberg, M.D., Danbury, joined the Council to discuss the treatment being given to individuals addicted to drugs and alcohol at the Danbury Hospital, and the Committee's recommendations to the Council concerning standards of patient care quality. Following a lengthy discussion, it was VOTED to accept the report for information, study and further consideration by the Council as expeditiously as possible.

Nominations of CMIC Directors for 1990 Election

On February 7, 1990, the CMIC Nominating Committee met to review nominations for seven directors to be elected by the membership in 1990. The following slate of director nominees was approved at that meeting and are recommended to the CMIC Board of Directors of their approval.

Fairfield County:	Daniel Doctor, M.D. (Ophthalmologist)
Hartford County:	Kevin Dowling, M.D. (Orthopedic Surgeon) Joseph Sadowski, M.D. (Neurosurgeon
Middlesex County:	W. Raymond James, M.D., (Internal Medicine)
New Haven County:	Mehdi Eslami, M.D., (Radiologist) Theodore Zanker, M.D. (Psychiatrist)
New London County:	Henry Brown, M.D., (Neuro surgeon)

The Council VOTED to approve the names as submitted.

Report on Legislation

Howard Westone, M.D., Chairman of the Committee on Legislation, reviewed the status of important current legislation, which he stated is still in a state of flux. The issues he discussed are as follows: Physical Therapy Bill, High Risk Driver Bill, Workers Compensation Bill, a bill extending insurance coverage, abortion bill, medicare assignment, tort reform, triplicate prescription bill, tanning salons, physician's assistant licensing bill, resident's bill, and several others.

Dr. Wetstone reported on a meeting that he and Kyle Ballou had with Craig Leroy, Executive Director of the Insurance Association of Connecticut to discuss the problem of the uninsured. At the suggestion of Dr. Wetstone, the Council VOTED to appoint three or four knowledgeable representatives to make an effort to establish a meeting with an equal number of knowledgeable representatives from IAC for the purpose of establishing a dialogue between the two organizations. It was suggested that Kyle Ballou should staff the meeting.

Medicaid Program

It was VOTED to refer to the Liaison Committee with the Department of Income Maintenance for consideration, the making of a study of Medicaid physician's fees in Connecticut and around the country.

Life Members

It was VOTED to receive as information the names of the following physicians who have been granted Life Membership:

Nathaniel R. Bronson, M.D., Fairfield (F)
Chester F. Cullen, M.D., West Hartford (H)
Grace D. Ellis, M.D., Waterford (NL)
Francis A. Klimas, M.D., Shelton (F)
Forrest E.H. Lightbody, M.D., Florida (F)
John L. Meyer, M.D., Woodstock (W)
Robert P. Noble, M.D., Lakeville (L)
James M. Trench, M.D., Mystic (NL)
Edward P. Wallace, M.D., Meriden (NH)

N.B. The foregoing is a summary of the proceedings and actions of the Council on February 22, 1990. Detailed minutes of the meetings are on file at 160 St. Ronan Street, New Haven, for perusal by any interested members of the Society.

CSMS PHYSICIAN PLACEMENT SERVICE

The Society maintains the Physician Placement Service as a free service to the medical profession in Connecticut. Opportunities for physicians to locate in Connecticut will be published as space permits and will be distributed to physicians making inquiries of such opportunities. Information should be sent to 160 St. Ronan St., New Haven, CT 06511 (203-865-0587).

Physicians wishing to establish practice in Connecticut are invited to submit a resume to be kept on file with the Society. An announcement of a physician's availability will be published in two issues of *Connecticut Medicine* as space permits.

Listing of physicians in the Placement Service does not in any way represent certification by the Society. Investigation of credentials and experience is the responsibility of those seeking applicants for positions.

OPPORTUNITIES FOR PRACTICE

AMBULATORY CARE

Ambulatory care facility seeks licensed physician with malpractice insurance for two to three Saturdays per month. 9:00 A.M. to 5:00 P.M. Please call 934-4357.

FAMILY PRACTICE/AMBULATORY CARE

Family Practice/Occupational Medicine in well established ambulatory care centers providing acute and continuing care at two locations in Connecticut. Well rounded medical background and excellent patient relation skills required. Part or full time position available summer 1990. Competitive compensation, enjoyable work settings and pleasant ancillary staff. Send CV to David E. Wilcox, M.D., Medical Director, or call for further information: PhysicianCare, 28 Main St., East Hartford, CT 06118 (203) 569-8644 or PhysicianCare, 60 Church St., Yalesville, CT 06492 (203) 284-9099.

FAMILY PRACTICE/INTERNAL MEDICINE

Family practice partnership looking for family practitioner, resident or internal medicine resident with general medical experience to do locum tenens work for summer 1990 in Old Saybrook. Very flexible hours can be arranged. Call Susanna Thomas, M.D., 453-8703 or 388-1495.

INTERNAL MEDICINE

Cardiology: BC/BE Cardiologist wanted to join multi-specialty internal medicine group, replacing a retiring cardiologist. Must be board certified in Internal Medicine and eligible or certified in cardiology. Must be a US grad. Terrific opportunity for teaching of House Staff in Yale affiliated residency program, CCU care, critical care, and non-invasive cardiology. No cath. Salary, benefits, and opportunity for partnership. Send CV to The Greenwich Medical Group, 49 Lake Avenue, Greenwich, CT 06830. (February 1990)

Physician for group IM Practice/Walk-in-Treatment Center in Farmington Valley (Connecticut). Experienced. Board certified in IM; FP; or EM. Competitive salary and benefits. Full time. Send CV to Box 555, Canton, CT 06019.

For sale or lease or share: fully equipped medical office; central location; 20 miles north of New Haven. Ideal for satellite office for one or two doctors. Low rent. Physician retiring. Write, CSMS, c/o IM/NV.

INTERNAL MEDICINE/FAMILY PRACTICE

Connecticut—Internal Medicine/Family Practice trained physicians BE/BC to join our nationally recognized physician group, now a primary affiliate of the largest and most rapidly expanding hospital in Connecticut. We are practicing aggressive primary clinical medicine in five offices surrounding the greater Hartford area. We have been chosen, and are participating in the IM/FP resident teaching programs for Hartford, St. Francis, University of Connecticut, and Mt. Sinai hospitals. We are looking for strong clinicians who enjoy patient contact, and have the desire and ability to help this group design and implement new clinical programs in an expanding medical delivery system. Immediate Medical Care Center, Inc. is also seeking physicians with expertise and desire to practice high quality academic, industrial medicine. If you are interested in further information call Gregg Grinspan, M.D., Medical Director of Immediate Medical Care Center at (203) 721-7393 or (203) 232-4891 or send CV to: 2080 Silas Deane Highway, Rocky Hill, CT 06067; ATTN: Physician Recruitment.

OBSTETRICS AND GYNECOLOGY

Opportunity for BE/BC, OB/GYN to join modern, progressive solo practice associated with 800-bed tertiary care teaching hospital with Level III Neonatal unit. Excellent university affiliated residency program. Emphasis on quality care with efficient staff including nurse practitioner. Academic appointment available. Laser, cryo, colpo and hysteroscopy. Family oriented community. Competitive salary. Please send CV to George Bacall, M.D., 21 Woodland St., Hartford, CT 06105. (203) 278-4141.

OPHTHALMOLOGY

For Sale. Eye Surgeon Practice; well-known. University town. Connecticut license and own malpractice needed. Write, P.O. Box 1085, Orange, CT 06477.

PART TIME

Ambulatory care facility seeks licensed physician with malpractice insurance for two to three Saturdays per month. 9:00 A.M. to 5:00 P.M. Please call 934-4357.

PATHOLOGY

Pathologist needed. Board certified, A.P.; part-time; occasional locum tenens; Fairfield county. Send CV to CSMS, c/o PATH/SS.

PEDIATRICS

Neonatologist: Seeking an additional BE/BC Neonatologist for established Level II NICU in Central Connecticut. Active affiliation with UConn Regional Perinatal Network. Position includes clinical and teaching responsibilities, developmental follow-up and opportunity for clinical research. Send CV to: A.M. Capriglione, M.D., New Britain General Hospital, 100 Grand St., New Britain, CT 06050.

Exceptional opportunity to join a pediatric group practice of four BC/BE pediatricians. Practice is located in shoreline community five miles from Yale-New Haven Medical Center, our chief hospital affiliation. Sole owner is original partner of practice established in 1955. Starting salary $80,000.00 per year with buy-in option after one year. Part time position also available. Call (203) 248-4846 any evening after 8:00 P.M.

BC/BE pediatrician to join two young pediatricians in growing, congenial practice in New Haven County. Affiliation with major teaching hospital. Salary leading to early partnership. Write, CSMS, PED/AC.

PHYSICIANS WISHING TO PRACTICE IN THE STATE OF CONNECTICUT

GENERAL SURGERY

Oct. '90. Age 37. Licensed in Connecticut. Presently in practice. FLEX. AB cert. MD, University of Juarez, Chichauahua, Mexico; Int. and Res., New Rochelle, NY. Prefers medium-sized community. Write, Porfirio J. Rodriguez, M.D., 147 Mississippi, Dyess A.F.B., Texas 79607-1011.

INTERNAL MEDICINE

March '90. Age 36. Nat'l bds. AB cert. MD, Albert Einstein College, Bronx, NY; Int. and Res., Morristown Memorial Hospital, Morristown, NJ. Prefers any type of practice especially group and ambulatory care. Write, Mark Tieman, M.D., 6 Gilbert Lane, Plainview, NY 11803.

May '90. Age 42. Presently in practice. Nat'l bds. AB cert. MD, Tufts Medical School, Boston, MA; Int. and Res., the Hospital of St. Raphael, New Haven, CT. Prefers group or associate type practice. Write, Michael F. Collins, M.D., 8259 Toll House Rd., Annandale, VA 22003.

INTERNAL MEDICINE/PEDIATRICS

Aug. '90. Age 31. Nat'l bds, AB elig. MD, The Chicago Medical School, North Chicago, IL; Int. and Res., Bridgeport Hospital, Bridgeport, CT. Prefers group or associate type practice. Write, Eldad S. Ben-Menachem, 460 Amsterdam Ave., Bridgeport, CT 06606.

OPHTHALMOLOGY

Immediately available. Age 35. Licensed in Connecticut. Presently in practice. Nat'l bds. AB cert. MD, Chicago Medical School, Chicago, IL; Int., North Shore University Hospital, Manhasset, NY: Res., SUNY Downstate Medical Center, Brooklyn, NY. Prefers group or associate type practice. Write, Andrew E. Gewirtz, M.D., P.O. Box 399, Jericho, NY 11753.

July '90. Age 37. Nat'l bds. AB cert. MD, New York Medical College, Valhalla, NY; Int., Baylor College of Medicine, Houston, TX; Res., New York Medical College; Fellowship, Hospital for Sick Children, Toronto, Ontario; McGill University, Montreal; Sheets and Associates Eye Center, Odessa, TX. Prefers a group practice in a large-sized community. Write, James H. Antoszyk, M.D., 4379 Walkley, Montreal Canada H4B 2K4.

ORTHOPEDIC SURGERY

June '91. Age 30. Nat'l bds. AB elig. MD, University of Pennsylvania, Philadelphia, PA; Int. and Res., West Virginia University, Morgantown, WV. Prefers group or associate type practice in a medium-sized community. Write, Robert W. Nolan, M.D., 202 Cedarstone Dr., Morgantown, WV 26505.

Jan. '90. Age 53. Presently in practice. Nat'l bds. AB cert. MD, Medical Academy, Wroclaw, Poland; Int. and Res., The Wellesly Hospital, Toronto, Canada; Fellowship, Montreal General Hospital, Montreal, Canada. Prefers solo or group type practice in a medium to large-sized community. Write, Andrew Tumiel, M.D., 27 Queen Anne Rd., Etobicoke, Ontario, Canada M8X 1T1.

RADIOLOGY

July '90. Age 32. Nat'l bds. AB cert. MD, Loma Linda University, Loma Linda, CA; Int., University of Nevado, Reno, NV; Res., Chief Resident, Germantown Hospital and Medical Center, Philadelphia, PA; Fellowship, University of Miami, Miami, FL. Prefers group or institutional type practice. Write, James L. Greve, M.D., 334 NE 103rd St., Miami Shores, FL 33138.

PAID CLASSIFIED ADVERTISING

All paid classified advertising orders, correspondence and payments should be directed to: CONNECTICUT MEDICINE, Classified Department, 160 St. Ronan St., New Haven, CT 06511, Tel. (203) 865-0587. The classified rates are as follows: $60.00 for 25 words or less; plus $1.00 for each additional word. For confidential answers, the cost is $3.00 per insertion, sent in care of CONNECTICUT MEDICINE. Ad copy, with payment, must be received no later than the first day of the month preceding month of issue.

OBSTETRICIAN/GYNECOLOGIST needed for a 110 births/year pre-pad group practice. Practice may convert to FFS; 37-1/2 hours workweek. On call every 3rd night/weekend. Malpractice paid for. Excellent salary & benefits. Call 675-5512.

FOR RENT. Office in superb Medical building. Excellent location, ample parking. (Riverview East, Norwalk). Part time use of three Exams Rooms. Full time use of own consultation room. Ideal for new practice or satellite office. Call 866-7000 for details.

GERIATRICIAN—The Hebrew Home and Hospital, a University of Connecticut, Travelers Center on Aging affiliated teaching nursing home with on-site geriatrics fellows has a position involving direct patient care and teaching with independent and collaborative research opportunities. Fellowship training and/or certification in geriatrics required. Must qualify for academic appointment. Contact David Silverman, M.D., Director of Medical Services, Hebrew Home and Hospital, 1 Abrahms Boulevard, West Hartford, CT 06117; (203) 523-3854.

Spontaneous Regression of Cancer

ROSE J. PAPAC, M.D.

SPONTANEOUS regression of cancer is defined as the complete or partial disappearance of a malignant tumor in the absence of therapy that is capable of inducing antineoplastic effects. It is significant that spontaneous regression is not synonymous with cure, since most patients ultimately relapse.

This phenomenon whose validity is sometimes questioned is one of the most fascinating observations in the practice of medicine. In a recent issue of the journal *Science,* Dr. Steven Rosenberg of the National Cancer Institute cites his experience, after seeing his first case during surgical training, as the beginning of a sustained research effort to prove the immune system could be utilized to "vanquish cancer."[1]

The medical literature includes reports of spontaneous regression of cancer with reasonable documentation since the early 19th century, although many would not meet criteria which have evolved for spontaneous regression. Osler reported two cases of carcinoma of the breast with disappearance of metastases in 1901.[2] Rhodenberg collected 300 patients reported by 1918.[3] Boyd, Everson, and Cole later reviewed published cases, and concluded that many were poorly documented.[4,5] In Everson and Cole's review of cases from 1900 to 1964, only 176 fulfilled the following criteria: documented histologic regression of biopsy proven metastases; radiologic regression of presumptive neoplastic disease; and regression of metastatic tumor following therapy generally deemed ineffective.[5] In this review cases of leukemia, lymphoma, and squamous cell carcinoma were excluded. These, however, were included in a subsequent conference monograph from the National Cancer Institute.[6]

Patients

We have observed eight patients who have experienced spontaneous regression of cancer and two patients in whom the possibility seems likely, although the role of therapy cannot be entirely excluded.

Case 1: NR, a 62-year-old woman, was seen initially in 1981 for a second opinion regarding chemotherapy for carcinoma of the lung. Three months earlier she had had a left upper lobectomy for adenocarcinoma of the lung. On follow-up evaluation a bone scan was consistent with metastases to ribs and pelvis. A computed tomographic scan of the abdomen showed three focal defects. The patient and her husband decided to defer chemotherapy for several months and vacation in the interim. In 1989 the patient returned again for a second opinion regarding chemotherapy. A year after the initial visit and without any chemotherapy or specific therapy the scans were found to be entirely normal. Following an eight year period during which the patient was clinically free of metastatic disease, a bone scan was again abnormal and biopsy revealed metastatic adenocarcinoma, consistent with the primary lung carcinoma.

Case 2: AS, a 42-year-old engineer, developed a malignant melanoma of the right thigh in 1971 followed by recurrence within six months following excision. Numerous satellite lesions developed and despite extensive surgical removal and local radiotherapy, there was rapid spread of the tumor to involve the entire extremity from toes to thigh. There was a massive necrotic hemorrhagic tumor requiring constant dressings and care. The patient and his wife pleaded for an amputation. Since there was then evidence of superficial lesions of the anterior abdominal wall and large iliac nodes, the procedure was performed with the understanding that cure would not result. Following surgery the patient's course was completed by a wound infection and delayed healing. On a follow-up visit in the clinic, vitiligo was noted on the trunk and face. Subsequently there was gradual disappearance of the melanoma lesions of the abdominal wall and the adenopathy. After a disease-free period of eight years, the patient developed disseminated melanoma and expired.

Case 3: JW, a 62-year-old man with angiographic evidence of renal cell carcinoma, underwent left nephrectomy although chest films showed two lung nodules. These were considered to be potentially resectable. Without any specific therapy these nodules regressed following nephrectomy. Six months later the nodules reappeared followed by additional metastases.

ROSE J. PAPAC, M.D., Chief, Section of Hematology/Oncology, Veterans Administration Medical Center, West Haven; Associate Professor of Medicine, Department of Medicine, Yale University School of Medicine, New Haven.

Case 4: An 82-year-old man developed a sanguinous pleural effusion following nephrectomy for renal cell carcinoma. A cytologic study of the fluid was consistent with carcinoma. The effusion resolved and did not recur during the patient's life.

Case 5: A 48-year-old man with disseminated melanoma received a plasma infusion from another patient who had experienced a spontaneous regression. This was followed by a partial regression of three months duration.

Case 6: A 54-year-old man was included in a randomized trial with a placebo control to evaluate treatment for multiple myeloma. There was complete disappearance of the monoclonal protein while receiving placebo.

Case 7: A 72-year-old man presented with liver metastases from colon carcinoma in 1979. The primary tumor had been resected in 1976; bowel obstruction developed in 1979 and liver metastases were seen at surgery. For 2 years the patient received weekly 5-fluorouracil with improvement and ultimately normalization of scans and abnormal liver function tests. The fluorouracil was discontinued and the patient has remained clinically free of disease for ten years.

Case 8: EW, a 52-year-old man, presented with acute myelomonocytic leukemia in 1967. The bone marrow showed 90% blasts, some with Auer rods. The patient who was acutely ill was considered a poor candidate for specific therapy. Nevertheless he was given a trial of 6-mercaptopurine (6-MP) with prednisone. The initial dose of 6-MP was 50 mg q.i.d.; inadvertently the order was rewritten as 50 mg q.d. after 10 days. The patient developed a complete hematological and clinical remission, without any toxic effects of treatment, and this has now been sustained for 22 years.

We have observed two additional cases considered to be spontaneous regressions, although we have not been directly involved in the management of these cases. One patient presented at a tumor conference had gastric carcinoma with hepatic metastases found at surgery. Without any additional therapy, the liver metastases resolved, documented by reexploration a year later. The second patient, seen only in consultation, had chronic lymphocytic leukemia which underwent remission for a four year period following a bout of pneumococcal pneumonia.

While these cases may all represent spontaneous regression, documentation of metastases by biopsy was present in the melanoma cases, in one patient with renal cell carcinoma, and in the gastric and colon cancer patients. The presumption of spontaneous regression seems reasonable in the initial patient with carcinoma of the lung and the second renal cell cancer. In cases seven and eight, the possibility of therapy exerting an effect cannot be excluded, although this type of outcome is most unusual.

Discussion

Over half of the reported cases of spontaneous regression of cancer reviewed by Everson and Cole developed in four tumor types—renal cell carcinoma, neuroblastoma, malignant melanoma, and choriocarcinoma.[5] The circumstances and undoubtedly the mechanisms of regression differ. It is of interest to examine some of the clinical features of spontaneous regression in certain neoplastic diseases.

Renal Cell Carcinoma

While renal cell carcinoma accounts for the largest number of patients with spontaneous regression, the histologic confirmation of metastatic disease is in the range of 20-25%.[7,8] The occurrence of spontaneous regression has been noted to involve predominantly pulmonary metastases. In the majority of cases, regression followed nephrectomy, although in a few instances radiotherapy to the primary tumor or biopsy of the tumor were followed by regression.[8-10] There has been an instance of tumor regression following plasma infusion from a family member who had experienced a spontaneous regression.[11]

Malignant Melanoma

Regression of primary cutaneous melanoma is not infrequent, as noted in several series (Table 1).[12-16] Regression is most likely to develop in lesions classified as thin melanomas, lesions that occur on the extremities, those that spread radially, show areas of whiteness and demonstrate an inflammatory component on histologic examination.[12-15]

Table 1
Spontaneous Regression of Malignant Melanoma

Primary Melanoma Total Number of Cases	Percentage	Institution
575	5	University of Chicago
549	24.6	New York University
486	56	Finsen Institute

In patients who present with metastatic disease and no apparent primary melanoma, regression of the primary is assumed.[17] Thirty-five instances of spontaneous regression of metastatic lesions are cited; of these only five had visceral deposits.[18,19]

Choriocarcinoma

Choriocarcinoma metastases generally regress following hysterectomy. While pulmonary deposits are predominantly involved, there are a few instances of vaginal metastases undergoing regression. The occurrence of regression is regarded as an instance of tumor rejection by the host, although other mechanisms likely play a role.[20] Choriocarcinoma is unique for the rarity with which the primary tumor can be identified following regression.

Neuroblastoma

Neuroblastoma is one of the most frequently observed instances of spontaneous regression, although the actual incidence is unknown. It occurs primarily in infants. There is a prediliction for skin and liver metastases to resolve. The histologic findings are either total disappearance of the tumor or maturation to a benign ganglioneuroma.[21,22]

Miscellaneous Solid Tumors

While the commonly occurring tumors such as carcinoma of lung, breast, prostate, and gastrointestinal tract were considered to undergo regression rarely, in the past decade there have appeared reports suggesting that the occurrence may be under reported.[23-27]

Hematopoietic Malignancies

Since 1980 three series of cases of low grade lymphomas have shown documented incidences of spontaneous regression. Gattiker et al observed 18 of 140 patients who had regressions and who had had either no treatment, or had been untreated for four or more years with stable disease which then regressed.[28] Of these 4.7% represented complete regressions. In a randomized trial in which patients with no treatment were compared to those with therapy for low-grade lymphomas, spontaneous regression was noted in five of 31 patients in the no treatment group; two had complete remissions.[29] Horning reported that 23% of cases of low-grade lymphoma reviewed at Stanford showed spontaneous regression.[30]

In high-grade lymphomas the incidence is less well documented. However there are cases of Burkitt's lymphoma, T cell lymphoma-leukemia, and some diffuse lymphomas with spontaneous regression.[30-35]

In chronic lymphocytic leukemia, there have been 30 well documented instances of spontaneous remission.[36-38] Of 285 cases observed in one report, three had spontaneous regression.[37] In a few patients, the T cell subsets remained abnormal despite clinical remission.[36,37]

Spontaneous remission in acute leukemia has generally been preceded by a period of leucopenia and tends to be brief.[38,39]

The actual incidence of spontaneous regression of cancer is difficult to determine. Many cases are not reported and it is now very unusual for cancer patients to remain untreated.

Many mechanisms have been invoked to explain the spontaneous regression of cancer. Table 2 shows factors cited by Everson, Cole, Sindelar, and Ketcham.[5,40] Immunologic factors play a role in some cases. Certainly the regression observed when immunosuppressive therapy is reduced suggests that immune modulation plays a role.[41] The regressions following infection suggest that interferon may be a mediator as well. Hormonal factors are considered significant because of observed regressions in women with carcinoma of the breast at menopause or at the onset of menses. In malignant melanoma three complete regressions were noted during pregnancy; in acute leukemia one patient had a complete remission following delivery.[19,42] Trauma is a factor in cases in which biopsy of the lesion or a metastasis resulted in regression. Irradiation to a single site followed by regression of tumor remote from the area of treatment is noted in some tumors. Infections, especially in leukemia, and occasionally in lymphoma have antedated regression. Drugs cited by Everson and Cole include antibiotics and generally low doses of cytotoxics.[5] The elimination of a carcinogen is assumed in cases of urinary bladder carcinoma in which diversion of the urinary stream was followed by regression.[5] Psychologic factors are of interest since it is postulated that metabolic aspects of emotional reactions could influence growth of tumors. Sindelar and Ketcham comment that "faith healers might derive benefit from this."[40]

Table 2
Factors Encountered in Patients with Spontaneous Regression (Everson and Cole[5] and Sindelar and Ketcham[40])

- Immunologic
- Hormonal
- Trauma
- Irradiation
- Infections
- Drugs
- Elimination of Carcinogen
- Psychologic Factors

While some of these factors undoubtedly play a role in spontaneous regression, research advances in the past decade indicate that the neoplastic process consists of a series of discrete steps beginning with oncogene expression and cellular transformation and culminating in progressive proliferation and metastases. At each step the tumorogenic process could be inhibited.

It is possible that suppression of oncogene activation, activation of suppressor genes, mutation to a lethal variant or depletion of growth factors or development of an unfavorable microenvironment by other mechanisms could be involved in spontaneous regression. It seems well established that the mechanisms for spontaneous regression include modulation of immunologic and hormonal factors and the induction of differentiation, particularly in neuroblastoma.

Spontaneous regression of cancer demonstrates that endogenous control of the neoplastic process is present. Identification of such mechanisms is an important area for research with the hope of enhancement of these natural processes that would result in more effective treatment of cancer in man.

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The Electrocardiographic Changes in a Case of Flecainide Overdose

PHILIP K.C. CHUNG, M.H.A., M.B.A. AND PHILIP TUSO, M.D.

ABSTRACT—Flecainide acetate is a new potent class I antiarrhythmic agent. We report serial electrocardiographic changes occurring in a case of flecainide overdose. The initial flecainide serum level was three times greater than the upper therapeutic level. The prolonged electrocardiographic time intervals (PR and QRS) decreased in correlation with falling drug levels. As the case was associated with concomitant alcohol intoxication, we speculate about the protective effect of alcohol in order to explain our patient's benign clinical course.

Introduction

FLECAINIDE acetate is a new potent class I antiarrhythmic agent which became available in the United States about two years ago. It produces marked suppression of nonsustained ventricular arrhythmias but has less consistent effects on sustained arrhythmias. As a class I antiarrhythmic agent, its major electrophysiologic action is sodium-channel blockade. Further subclassifications of sodium-channel blockers depend on their effects on repolarization or on the speed of dissociation from the sodium-channel. In the case of flecainide, drug dissociation from the sodium-channel is very slow (time constant of 10-30 seconds) when compared with quinidine (four to eight seconds) and lidocaine (less than one second),[1] and prolongation of PR, QRS, and QTc intervals is routinely seen during this treatment.

Flecainide possesses advantages over other class I antiarrhythmic agents in having less side effects (mainly transient central nervous system symptoms of dizziness and dysfunction in visual accomodation), and in having a long half-life (13-27 hours).[2] Unfortunately, adverse cardiac effects include moderate negative inotropic action, depression of all conduction pathways, ventricular tachyarrhythmias, and severe bradycardia.[3]

Flecainide overdose has only been rarely described in the literature.[3,4] We report the serial EKG changes in a young female after flecainide overdose.

Case Report

A 25-year-old white female, with a history of alcohol abuse and wrist-cutting suicidal attempts, had been given flecainide (100 mg twice daily) for frequent idiopathic premature ventricular complexes associated with recurrent paroxysmal palpitations. Previous antiarrythmic drug treatment included propranolol. A pretreatment Holter electrocardiogram (EKG) was performed but the patient had refused an echocardiogram for diagnostic purposes. A 12-lead EKG (Fig. A) revealed sinus rhythm, a rate of 76, a normal axis, and normal intervals. Three months later the patient was hospitalized after taking an overdose of flecainide in a suicide attempt, ingesting 2,500 mg of flecainide (25 tablets of 100 mg each) five hours before admission. She was alert but uncooperative. Her vital signs were normal and her physical examination was unremarkable. The serum potassium, calcium, and magnesium levels were normal. The SGOT and SGPT were 71 and 89 IU/L respectively. The initial EKG after hospitalization (Fig. B) revealed first degree AV block with a right bundle-branch block, corresponding with a flecainide level of 3,500 ng/ml (therapeutic blood level = 200-1,000 ng/ml)[1] and blood alcohol level of 196 mg%. The patient's clinical course was benign and she was treated conservatively. Further EKGs (Figs. C,D) gradually returned to baseline three days after admission as her flecainide levels fell (520 ng/ml). The patient remained stable without complex arrhythmias and left the hospital against medical advice.

Discussion

Antiarrhythmic drugs can induce arrythmias instead of suppressing them and flecainide is no exception. The most dangerous adverse effect is ventricular tachycardia as it can degenerate to ventricular fibrillation and lead to sudden death. However, bradycardia can also occur, as noted in a report of flecainide overdose in which the

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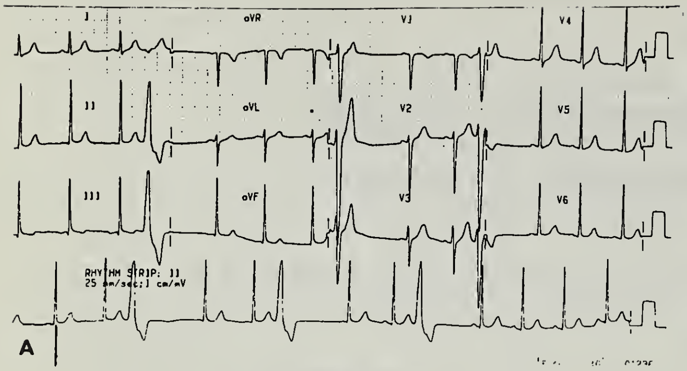

Figure A

Twelve-lead electrocardiogram of patient shortly after initiation of flecainide (100 mg by mouth every 12 hours) demonstrating multiple ventricular complexes with a PR interval of 0.13 seconds and a QT interval of 0.344 seconds.

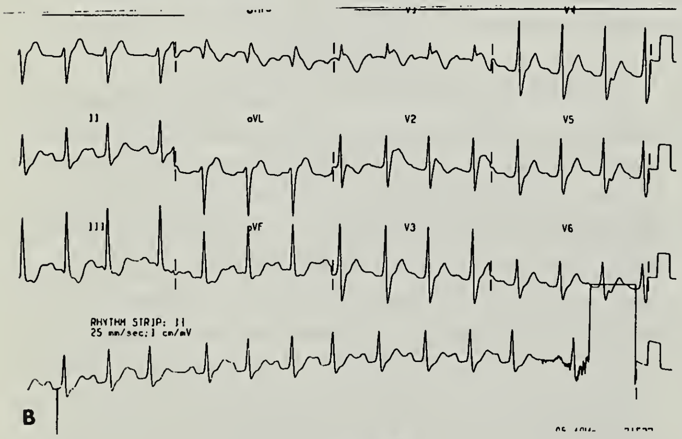

Figure B

Twelve-lead electrocardiogram of patient when serum flecainide level was 3,500 ng/ml. Electrocardiogram is remarkable for a first degree atrioventricular block (PR interval of 0.26 seconds), right bundle branch block (QRS interval of 0.14 seconds) and a QT interval of 0.42 seconds.

patient developed an atrioventricular nodal escape rhythm.[4] In general, flecainide slows conduction throughout the myocardium and causes an increase in myocardial refractoriness with little effect on repolarization. This. results in an increase in the PR intervals and QRS duration, and minimal changes in the QT intervals. The apparent prolonged QT has been explained by the changes in QRS duration.[1,5]

Our patient shows a correlation between the high flecainide levels and the widening of the QRS complex and increase in PR interval (Figs. B, C). As the flecainide levels fell, the QRS complex and PR interval narrowed—a pattern noted also by other authors,[6] suggesting that the intervals may be used as predictors of myocardial drug concentrations.

The plasma concentration six hours after the flecainide overdose in our patient was 3,500 ng/ml, falling to 520 ng/ml in 78 hours after ingestion. The plasma elimination half-life was 29.5 hours (Fig. E), slightly greater than that reported by Dubb et al.[2] This prolonged half-life may be due to the patient's abnormal liver function even though flecainide elimination is primarily renal.[1]

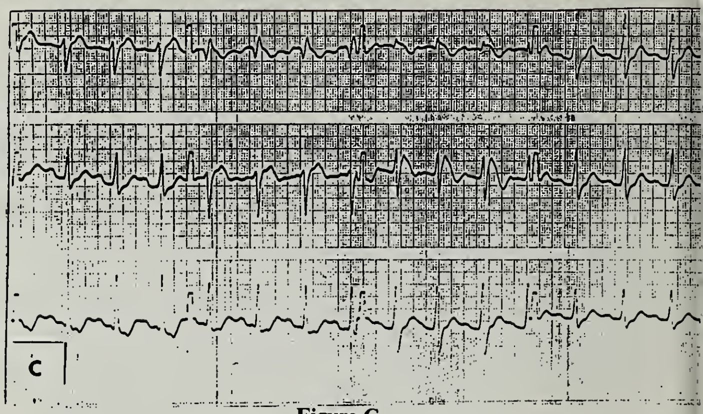

Figure C

Twelve-lead electrocardiogram of patient after serum flecainide level had decreased to 2,200 ng/ml. Note persistence of first degree atrioventricular block and right bundle branch block.

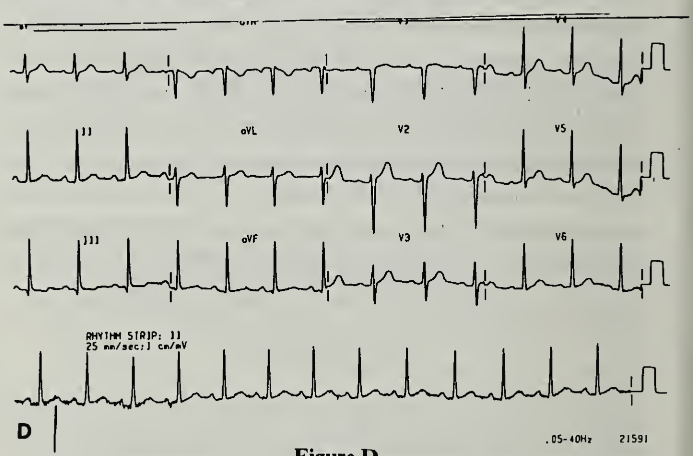

Figure D

Markedly improved electrocardiogram when serum flecainide level was 520 ng/ml. Intraventricular conduction delay persists but PR interval, QRS interval and QT interval are improved to 0.22 seconds, 0.10 seconds, and 0.39 seconds respectively.

The EKG of our patient returned to normal base-line 54 hours after the flecainide intoxication, corresponding to an expected plasma concentration of approximately 1,200 ng/ml, in full agreement with the findings of Spivack et al that values greater than 1,500 ng/ml might be associated with toxicity.

Unlike the patient presented by Winkelman and Leinberger,[3] our patient's clinical course was relatively benign despite their similar plasma levels. Our patient did not show the severe sinus node depression and bradycardia reported by Fach et al,[4] nor the ventricular arrhythmia reported by Winkelman and Leinberger.[3] As our patient was not on any other medication, this benign course of flecainide overdose can be explained either by its idiosyncratic variable response or an interaction between flecainide and alcohol ingestion. Because of the hepatic metabolism of the drug and the patient's abnormal hepatic functions, one may wonder about the relationship of these factors to flecainide blood levels. Since flecainide is renally excreted, the abnormal liver function tests cannot entirely explain the greater plasma half-life

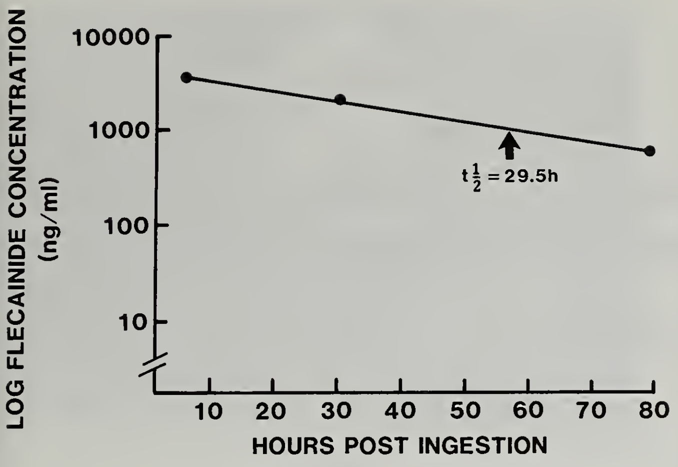

Figure E

Elimination pharmokinetics of flecainide in the reported patient. T ½ (see arrow) was determined to be approximately 29.5 hours.

in our patient. As beta-sympathomimetic agents are used in the treatment of flecainide overdose,[3] the authors also speculate that the sympathetic action of the alcohol metabolite acetaldehyde[8] may indirectly protect the patient from the adverse effect of flecainide intoxication. Further investigation is required.

Flecainide is a potent agent and following overdose has marked effects on cardiac conduction. Care must, therefore, be taken to avoid high concentrations, and close blood level monitoring is particularly important in patients with congestive heart failure and/or renal or hepatic insufficiency.[1] For the same reasons, before prescribing antiarrhythmic drugs, physicians should be careful to identify not only patients with conduction abnormalities but also those who are at risk for suicide, or who abuse alcohol, or are receiving other drugs.

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Cardiac Tamponade as a Result of American Burkitt's Lymphoma of the Heart and Pericardium

JEFFREY HELFAND, D.O.

ABSTRACT—Recently an increasing number of cases of malignant lymphoma with extranodal sites of involvement have been reported in homosexual and bisexual males as well as other patients suffering from AIDS. Many theories have been suggested as to the reasons for the development of these lymphomas in these patient populations. Here we present a case of a homosexual male who presented initially with constitutional symptoms, a rapidly deteriorating clinical state, and cardiac tamponade caused by American Burkitt's lymphoma infiltrating the pericardium and heart. Current literature and theories are discussed.

Case Presentation:

A previously healthy 35-year-old homosexual male presented with approximately two weeks of abdominal bloating, nausea, and a 5 to 6 kg weight gain despite dieting. On admission he complained of approximately 48 hours of exertional dyspnea, shortness of breath at rest, four-pillow orthopnea, and "acid indigestion." His medical history was significant for treated syphilis and gonorrhea in the distant past, and hepatitis of unknown origin approximately 10 years earlier. He had been admitted about two weeks earlier for renal colic, and an intravenous pyelogram at that time revealed a dilated left ureter without evidence of stones or hydronephrosis. His social history was remarkable only for a 30-pack-year history of cigarette use, and a history of promiscuous sexual behavior in the distant past.

On admission the patient was a moderately obese white male in no apparent distress; his pulse rate was 104, temperature was 37.1°, respiratory rate was 20, and his weight, 104.5 kg. Physical examination revealed tenderness in the midepigastrium, and the liver edge was 14 cm beneath the right costal margin. No shifting dullness could be appreciated, nor could his spleen be palpated. He had no lymphadenopathy, and cardiorespiratory examination was unremarkable, without evidence of jugular venous distension or hepatojugular reflux. The presence of anal condylomata was noted. Laboratory values on admission showed normal serum electrolytes, BUN, creatinine, total protein, and albumin; with abnormal alkaline phosphatase 474 U/L, aspartate aminotransferase 127 U/L, alanine amino transferase 133 U/L, lactic dehydrogenase 734 U/L, gamma glutamyl transferase 218 U/L, and total cholesterol 99 mg/dl. A blood count revealed 6,300 wbc with a normal hemoglobin, hematocrit, and a normal differential count. The erythrocyte sedimentation rate was 5mm/hour, and prothrombin and partial thromboplastin times were both normal. An ECG revealed a sinus tachycardia with low voltage. Chest roentgenography revealed an enlarged cardiac silhouette with a right subpulmonic effusion; an abdominal plain film was unremarkable.

On the second hospital day the patient complained of severe shortness of breath at rest, was tachypneic, and developed a pulsus paradoxus of 25-28 mmHg. 2-D and M-mode echocardiography were performed and revealed a large pericardial effusion, systolic anterior motion of the mitral valve, and early diastolic collapse of the right ventricle. Concentric left ventricular hypertrophy was detected on the M-mode portion of the examination. The 2-D portion of the study (figure 1) revealed the presence of a large mass with some cystic quality within the right ventricular free wall, which extended from the apex to the mid-right atrium and left ventricle, as well as early diastolic collapse of the right atrium (figure 2). Computed tomography of the chest and abdomen revealed large pleural and pericardial effusions, as well as a small amount of ascites. A ventricular mass could not be visualized. No abnormalities in the hepatic or pancreatic architecture were noted, and the spleen was of normal size. Because of severe hypotension thought to be due to impending cardiac tamponade, emergent pericardiotomy was performed, and a 5 cm pericardial window was made. At pericardiotomy, the surgeon noted an immediate gush of 1000 ml of bloody fluid from the pericardial incision. Further exploration of the pericar-

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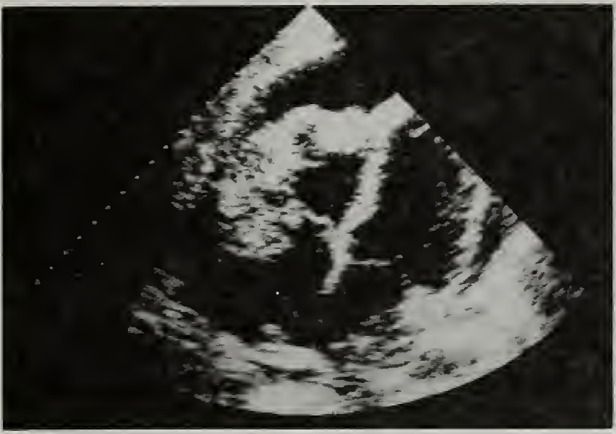

Figure 1
2-d Echocardiographic image revealing a cystic appearing mass within the free wall of the right ventricle.

dium and heart revealed a large lobulated mass in the anterior wall of the right ventricle, but because of the thinness of the ventricular wall, biopsy was not performed. In the immediate postoperative period, the pulsus paradoxus disappeared, and subsequent hemodynamic monitoring revealed the intracardiac pressure to be consistent with a restrictive process, probably related to the tumor mass. The patient improved briefly but began to deteriorate rapidly within the first 24 hours with fever spikes to 39.7 degrees C. Hypotension and severe lactic acidosis developed requiring pressor agents and intravenous sodium bicarbonate. A chest radiograph at that time revealed bilateral fluffy infiltrates consistent with pulmonary edema. The patient then developed evidence of diffuse intravascular coagulopathy, thought to be secondary to septic shock. Empiric antibiotic therapy was started, but the patient's condition continued to deteriorate over the next 24 to 36 hours.

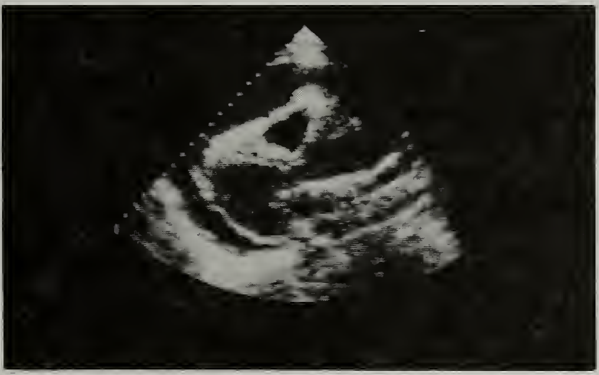

Figure 2
2-d Echocardiographic image showing early diastolic collapse of the right ventricle.

Initial histologic evaluation of the pericardium revealed aggregates of infiltrating tumor in the pericardial fat (figures 3, 4) and primitive lymphoblastic cells within the pericardial fluid cell block in a pattern consistent with that of American Burkitt's lymphoma. Immunostaining was methyl green pyronine positive, and kappa and lambda negative. An attempt was made to reduce the tumor mass with vincristine, but he continued to decline, and late on the second postoperative day, developed bradycardia and could not be resuscitated. Because of the rapidly deteriorating clinical course, neither HIV antibody, Epstein-Barr viral antibody titers, nor T-cell subsets could be performed. Permission for postmortem examination could not be obtained, and the presence of *Pneumocystis* pneumonia could not be determined. All culture reports were negative.

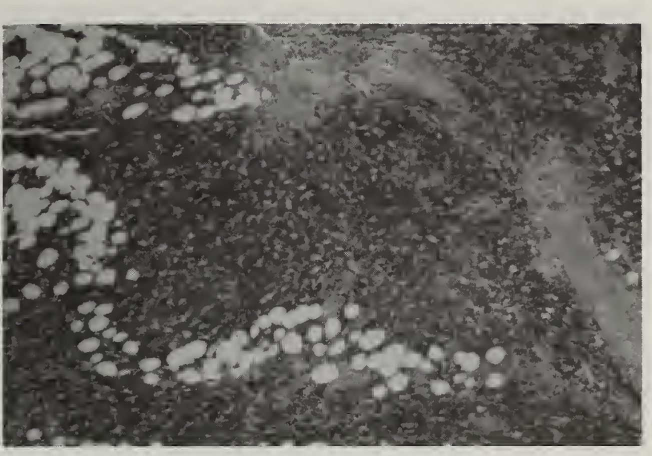

Figure 3
Infiltration of pericardial fat by tumor mass.

Discussion

It is well known that immunosuppressed patients are at an increased risk of developing lymphoproliferative malignancies. This has been often seen in patients with primary immunodeficiencies such as Wiskott-Aldrich syndrome, ataxia-telangiectasia, and Bloom's syndrome. There have also been many reports of lymphoproliferative malignancies in patients with secondary immunodeficiencies as can be seen in tissue transplantation patients and in other patients receiving immunosuppressive therapy. Numerous cases have also been reported in patients with autoimmune disorders such as Sjögren's syndrome and autoimmune hemolytic anemia irrespective of immunosuppressive therapy. The common denominator appears to be a defect in cell-mediated immunity.

It appears that malignant lymphomas that develop in immunosuppressed patients tend to be more aggressive in nature, and are more often associated with extranodal involvement than are those in patients with normal cellular immunity. Recently an increasing number of malignant non-Hodgkin's lymphomas have been reported in homosexual and bisexual males, as well as in patients with AIDS. In 1982 Doll and List presented what appears to be the first case of American Burkitt's lymphoma in a homosexual male.[1] There are currently about 200 reports of homosexual and bisexual males, and patients with AIDS in whom a malignant non-Hodgkins lymphoma has developed.[2-9] As in those patients with altered cell-mediated immunity, there appears to be a predominance of extranodal

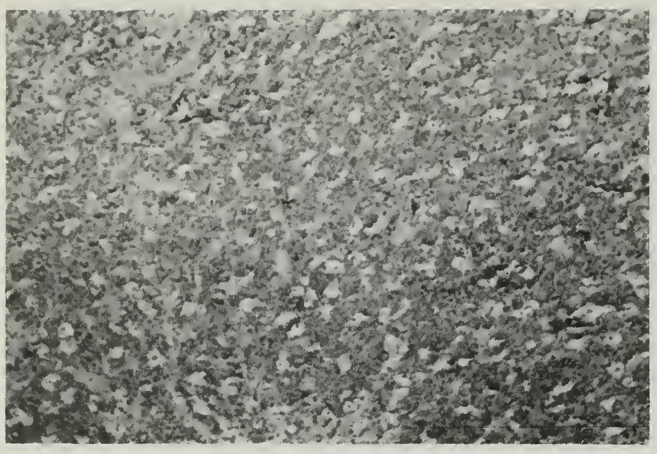

Figure 4
"Starry sky" pattern characteristic of American Burkitt's lymphoma.

involvement. In the largest study by Ziegler et al,[5] 88 of 90 homosexual men with lymphoma had extranodal, high-grade lymphomas. The majority of these lymphomas appeared to involve the bone marrow, brain, meninges, and gastrointestinal tract. Involvement of the heart and pericardium, however, was relatively infrequent, occurring in only one of these patients.

Of all patients with malignant non-Hodgkins lymphoma, there are fewer than 50 reported cases of involvement of the heart or pericardium. Almost all of these cases have been diagnosed at autopsy. Of the approximately 200 reported cases of AIDS patients, or homosexual and bisexual males with non-Hodgkins lymphoma, only eight thus far have been found to have cardiac involvement. Three of these presented initially with cardiac tamponade and a large pericardial effusion. Only one of these patients, however, presented with constitutional symptoms as the chief complaint.[10] In the study by Ziegler et al,[5] of the 90 patients enrolled, only one had evidence of either cardiac or pericardial involvement. In 1987, Guarner et al[11] reported what appeared to be the first two cases of primary cardiac non-Hodgkins lymphoma in two male homosexuals, both of whom were admitted with *Pneumocystis carinii* pneumonia and died of their pneumonias, but who were found at autopsy to have primary cardiac non-Hodgkins lymphomas.

There are several theories as to the reasons for development of non-Hodgkin's lymphoma in patients with depressed cellular immunity. These include: 1) defects in immune surveillance, 2) chronic antigenic stimulation leading to transformation and proliferation of clones of malignant lymphocytes, 3) reactivation of latent herpes-group viruses with oncogenic capabilities, and 4) the direct oncogenic effects of immunosuppressive agents. Another theory gaining acceptance is that recent transmission of an infectious agent such as Epstein-Barr virus may also be responsible for development of a lymphoma, rather than reactivation of a latent oncogenic herpes-group virus. Kamani et al[12] and Gordon et al[13] present two cases of Burkitt's lymphoma occurring in pediatric patients, one of whom had a positive HIV antibody test. The other patient was a hemophiliac who had received Factor VIII concentrate for two years. Two recent case studies appear to present evidence for this theory as well: one involving a cluster of four patients in a rural Pennsylvania community living within 50 km of each other who developed malignant non-Hodgkin's lymphoma, and all of whom had antibodies to Epstein-Barr virus,[14] and a second study of three nonconsanguinous couples living in Canada who had lived with their respective spouses for at least 25 years, each of whom developed a B-cell, non-Hodgkin's lymphoma identical to that of his or her spouse within 5-8 years of the spouse developing lymphoma.[15]

Chromosomal translocations from chromosome 8 to 14 (specifically at the c-myc oncogene locus) have been commonly found[8,16-20] and similar translocations from chromosome 8 to chromosomes 2 or 22 have been found occasionally in patients developing non-Hodgkins B-cell lymphomas, suggesting chromosome breakage as a possible mechanism. This has been especially true of patients with previous Epstein-Barr virus infection. Bernheim and Bergen[21] and Ganser et al,[22] however, have reported patients in whom Burkitt's lymphoma occurred without evidence of previous Epstein-Barr virus infection.

Conclusion:

Non-Hodgkin's lymphomas are becoming an increasingly common disease process with constantly changing presentations, for which no clear etiology can be determined. A similar presentation in a patient known to be at high risk for AIDS should alert one to consider the possibility of a similar disease process in hopes of avoiding a catastrophe such as occurred in this case. We support the use of early diagnostic procedures such as echocardiogram and hemodynamic monitoring in similar situations to exclude the possibility of pericardial involvement in these patients.

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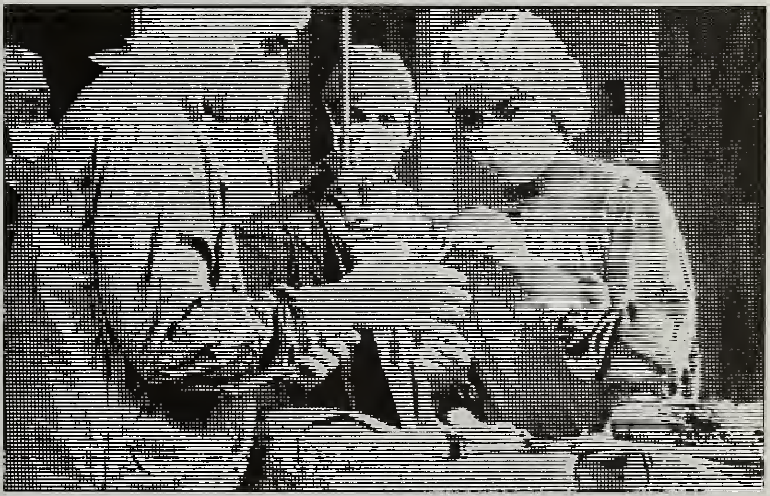

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Abstracts of Papers

CONNECTICUT SOCIETY OF AMERICAN BOARD SURGEONS

FOREWARD: The Connecticut Society of American Board Surgeons held its annual meeting on 14 December 1988. A total of 43 abstracts were submitted and 12 papers selected. The moderators were Dr. Irvin Modlin, Professor of Surgery, Yale University School of Medicine and Dr. Barbara Kinder, President, Connecticut Society of American Board Surgeons.

Kirk K. Kazarian, M.D., F.A.C.S., Chief of Surgery, Department of Surgery, Stamford Hospital.

Orthotopic Bladder Substitution with Intestinal Segments

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The development of an ideal substitute for a functioning urinary bladder is a longstanding urologic problem. Ureterosigmoidostomy provides for continence but frequently results in recurrent pyelonephritis and system acidosis. The ileal conduit has been the standard urinary diversion for the past 30 years, and while relatively free of complications, it requires an external collecting device. Recently, there has been a renewed interest in continent urinary diversion and bladder substitution. The latter, while more desirable, is associated with a high incidence of nocturnal incontinence. In a search for the ideal bladder substitute, we have employed a variety of intestinal segments and carried out urodynamic evaluations postoperatively to determine the factors associated with nocturnal incontinence.

Twelve male patients have undergone bladder substitution—one with tubularized sigmoid, three with detubularized right colon, five with an ileo-colonic pouch and three with detubularized ileum anastomosed to the urethra. Another seven patients, three men and four women, have had a urinary diversion with a continent stoma on the abdominal wall. Urodynamic evaluation, serum electrolytes, and urine cultures were done postoperatively in all these patients.

It was found that despite adequate detubularization of colonic segments, capacity is lower and peak pressures are higher (50-110 cm H_20) than when a detubularized segment of ileum is included in the pouch (peak pressures 10-60 cm H_20). This correlates with a decrease in the incidence of nocturnal incontinence in the latter group. More recently, detubularized small bowel has been used to fashion a bladder pouch. This procedure, while technically more difficult with regard to a satisfactory antireflux ureteral implantation and urethral anastomosis, appears to provide for a lower pressure reservoir. Nocturnal incontinence is more easily controlled in these patients by getting up one to two times at night to void. Nocturnal incontinence will probably continue to be a problem in some patients, if there is any muscular tone in the reservoir, probably because of the loss of the urethrovesical reflux that normally inhibits bladder contractions during sleep. Patients who exhibit intrapouch pressures of less than 10 cm H_20 have been found to have difficulty in voiding and have had to resort to self-intermittent catheterization. Bladder substitution with bowel segments represents a major advance in reconstructive surgery of the urinary tract.

Perforated Diverticular Disease: A Changing Clinical Scene

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The evolution of the surgical management in patients with acute colonic diverticulitis has changed from multiple staged operations towards single procedures. We have reviewed the patterns of presentation and treatment for perforated diverticulitis in a five-year period (January 1983-July 1988). There were 296 admissions for acute diverticulitis, of which 131 patients presented with acute perforation of the left colon. The Hinchey classification system (Types I-IV) has been used to standardize the various forms of clinical presentation with patient management. The classification distribution was: Type I, n=81; Type II, n=36; Type III, n=13; and Type IV, n=6. All four groups of patients were comparable for the distribution of age, sex, and associated diseases. Four types of surgical procedures were identified: Primary resection with anastomosis (n=87); primary resection with anastomosis and protective colostomy (n=5); primary resection with Hartmann procedure (n=32); and delayed resection as a three-staged procedure (n=7).

The postoperative mortality rate of patients undergoing primary resection and anastomosis (with or without protective colostomy) was lower than that of patients having a Hartmann's procedure (3.4% versus 15.3% respectively). The mean length of stay for initial hospitalization was least for primary resection with anastomosis (15.1 ± 0.7 days) for primary resection with anastomosis and protective colostomy (18.2 ± 5.0 days), for Hartmann procedure (14.9 ± 1.2 days), and was greatest for patients having a delayed resection (24.4 ± 3.2 days). Patients who required a second admission for closure of loop colostomy had a mean length of hospital stay of six days but when bowel reconstruction was required following a Hartmann's operation, the hospital stay was more than doubled (13 days). In the Hartmann procedure group, there was a high rate of early and late postoperative complications including 23% wound infection and 15% requiring a second operation for the treatment of late complications. Only half of the patients in the Hartmann group had bowel reconstruction during the period of study and this procedure alone was associated with a 3.8% mortality.

In summary, these data demonstrate that primary resection with anastomosis is a satisfactory operation for the majority of patients (Type I, II, and III) who present with perforated diverticular disease of the left colon. There appears to be no clinical indication to use a three-staged operation in these patients. However, in the presence of fecal peritonitis (Type IV disease) or widespread intraabdominal sepsis, the exact indications and contraindications to perform a primary anastomosis require further clinical investigation.

Colonic Obstruction Due to Endometriosis

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Cases of endometriosis as the cause of colon obstruction are examined to illustrate the problems in diagnosis and management of this entity.

Nine cases of colonic obstruction due to endometriosis were identified over a 32 year period (1956-88), representing less than one percent of large bowel obstructions seen at this community hospital during this time. The average age was 41 years (range 28-58). Crampy abdominal pain was the most common presenting symptom (100%); other complaints included diarrhea (33%), constipation (22%), tenesmus (22%), small caliber stools (11%), abdominal distension (11%), and blood per rectum (11%). Bowel symptoms were noted to be cyclic in four of the nine patients. Seven of these nine patients had a history of dysmenorrhea, and four had endometriosis documented by previous surgery.

Barium enema was performed in six patients and endoscopy in five patients. All cases involved the sigmoid or rectosigmoid colon. In no case was the diagnosis established endoscopically. Surgical procedures included resection with primary anastomosis (six patients), and resection with sigmoid end-colostomy Hartmann's pouch (three patients). In only one case was full-thickness colonic wall involvement noted. One patient had an adenocarcinoma of the colon adjacent to the area of endometriosis.

Endometriosis should be considered in the differential diagnosis of colonic obstruction in women of childbearing age, especially in association with a history of dysmenorrhea or cyclic changes in bowel habits.

Endoscopic Detection of Early Neoplasms of the Gastrointestinal Tract: Can We Improve End Results of Treating Gastrointestinal Malignancies?

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End results for treating gastric and colorectal cancer have not improved in this country for more than 30 years. Unfortunately, the overwhelming majority of gastrointestinal malignancies are discovered at a stage for which surgical resection promises little hope of cure. Furthermore, adjuvant chemotherapy and radiotherapy have achieved no impact on survival. These dismal results suggest that the only chance of improving end results for the treatment of gastrointestinal malignancies lies in identifying these lesion at an early curable stage. Consequently, our surgical endoscopy service has been aggressively evaluating gastrointestinal symptoms as well as screening asymptomatic patients with esophagogastroduodenoscopy and colonoscopy in hope of finding early, curable lesions.

The purpose of this study was to determine the impact of endoscopy on detecting early gastric and colorectal neoplasms. Early gastric cancer was defined as gastric cancer limited to the mucosa and submucosa regardless of regional lymph node status. Early colorectal cancer was defined as lesions limited to the bowel wall classified as Duke's A lesions. The pathologic stages of gastric and colorectal malignancies were reviewed for two time periods: the period prior to aggressive endoscopic screening and the period following the initiation of aggressive screening. The results are listed below.

	Pre-Screening			*Post-Screening*		
Type	Early	Total	% Early	Early	Total	% Early
Gastric	1	207	0.5	21	127	16.5
Colorectal	3	32	12	41	86	46

These results indicate that aggressive endoscopic screening resulted in a 32-fold increase in the detection rate of early gastric cancer. Similarly, aggressive endoscopic evaluation of the colon caused a 4 fold increase in identification of early curable colorectal cancers. This study suggests that aggressive evaluation of nonspecific gastrointestinal symptoms as well as endoscopic screening of both high risk and asymptomatic individuals may lead to an improvement of end results of treatment for gastric and colorectal cancers by detection of an increased number of early curable lesions.

Surgical and Nonsurgical Abdominal Pathology in AIDS Patients

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There have been over 55,000 cases of AIDS reported to the CDC (1988) since AIDS was initially characterized in 1981. As the number of cases continues to increase, the surgeon will be more frequently involved in the management of patients with AIDS. This study retrospectively reviewed 69 patients with CDC criteria AIDS from January 1983 to June 1988. Twenty-seven of these patients had gastrointestinal complaints and 12 of those complained of abdominal pain. Data analyzed included number of patients evaluated by a surgeon, modes of surgical therapy, other invasive procedures performed, and final gastrointestinal pathology. The patients with abdominal pain were compared in relation to symptoms, physical findings, and laboratory findings. Although the group size was small, several conclusions could be drawn. It was found that gastrointestinal complaints were common but pathology requiring surgical intervention was uncommon. Infections peculiar to AIDS patients accounted for a large number of abdominal complaints. Most surgery in these patients was limited to diagnostic biopsy and IV access procedures. Finally, preliminary data suggest it may be possible to separate an infectious cause from other etiologies of abdominal pain on the basis of clinical data alone in a high percentage of cases.

Congenital and Acquired Breast Deformities in Young Adults and Children: Evaluation, Treatment, and Prevention

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Thirteen females, ages 12 through 35 years, were evaluated for disfiguring acquired or congenital breast deformities over a 40 month interval (See Table). While five of the 13 patients had no apparent etiology for their deformities, five of the patients' affected breasts had been violated by thoracotomy incisions for treatment of cardiac anomalies or childhood malignancies within the first two years of life. Three patients' deformed breasts had been subjected to radiotherapy for childhood malignancies between ages one and six years. One patient had merely undergone transpectoral thoracostomy tube placement on the affected side as a neonate.

Congenital/Acquired Breast Deformities
(Unilateral or Bilateral Asymmetrical)
(13 Patients)

Deformity	Hypoplasia	Tubular	Ptosis	Transmammary Contracture	Nipple Deform Malposition
# Pts.	12	7	6	5	7

To date, seven of the 13 patients have undergone surgical reconstruction of their breast deformities. Four of the surgical patients were treated with unilateral submusculofascial silicone implant placement (with or without local flaps or z-plasty), two patients were managed with bilateral differential implant placement with unilateral mastopexy, and one patient was treated with unilateral implant placement and contralateral mastopexy.

With eight to 40 months' follow-up (median follow-up 29 months), no patient has had recurrence of her deformity and all wounds remain healed. One complication, intraoperative pneumothorax, occurred in a patient status postradiation therapy.

Undeveloped breast buds in infants and children are particularly susceptiable to injury from trauma or necessary interventions as the total distance from clavicle to costal margin measures as little as six to eight centimeters. In many patients, however, the etiology of breast deformity cannot be determined. With thoughtful evaluation, timing, and selection of combinations of reconstructive procedures, patients with these often grotesque deformities may achieve gratifying results.

Elective and Emergent Procedures in Nonagenarians

L. SCHRADER, M.D., M. A. MCMILLEN, M.D., C. B. WATSON, M.D., and J. D. MACARTHUR, M.D.,
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Advanced age is often considered sufficient indication for preoperative Swan-Ganz placement and "tune-up," even in the absence of significant cardiac or other intercurrent medical disease. Yet data supporting this position are difficult to obtain and nonagenarians are often a remarkably spry and healthy population. All major general surgical and orthopedic operative procedures performed in nonagenarians were reviewed for our institution for the academic year 1987-88. Nonagenarians now represent 0.73% of patients undergoing surgery in our hospital. None of the general surgical patients had Swan-Ganz catheterization and no patient had a preoperative ICU "tune-up." Ten mastectomies or major abdominal procedures were performed under general anesthesia, and 25 major orthopedic procedures were performed under general anesthesia. Balanced anesthesia technique was often used and no major intra- or postoperative complications were encountered. Thirty-day mortality was 0%. Nonagenarians are often a self-selected group of physiologically resilient individuals. Careful contemporary anesthesia technique and expeditious surgery allow major procedures in nonagenarians without the necessity for preoperative ICU tuning.

Predictive Factors for Postoperative Mortality in the Lower Extremity Amputee

LEE SPRANCE, M.D. and KIRK K. KAZARIAN, M.D., Department of Surgery, Stamford Hospital.

A retrospective analysis was performed on 53 consecutive patients who underwent 66 amputations during a five-year period from 1982-86 for complications of diabetes mellitus and/or peripheral vascular disease in an attempt to determine which subset of patients is at the greatest risk of death in the post-operative period. Overall, there was a 10.6% 30-day mortality, and a 16.7% hospital stay mortality. Five factors in the patients' preoperative status appear to correlate with outcome: previous myocardial infarction, diabetes mellitus, hypertension, congestive heart failure, and acute changes on the preoperative ECG. None of the patients had all five factors. Mortality rates among those with one to four factors were 0%, 15%, 28.6%, and 40%, respectively. Two patients with no predictive factors died from unexpected, noncardiac causes. Eleven patients were monitored postoperatively in the intensive care unit setting, eight of whom had Swan-Ganz catheters. Seven of the 11 underwent therapeutic measures, e.g., lidocaine, intravenous, nitroglycerin, and dopamine, which improved their outcome. Only two patients who were monitored postoperatively died. The results indicate that there is a set of predictive factors which may help to identify those patients at greatest risk of dying postoperatively and could improve survival by monitoring these high risk patients in the intensive care setting.

Infrapopliteal Bypass for Salvage: The Hospital Experience

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and PHILIP ALLMENDINGER, M.D., Department of Surgery, Hartford Hospital.

Infrapopliteal bypass is the only alternative to amputation or near-total disability for many patients with limb-threatening ischemia or debilitating claudication. The results of all infrapopliteal bypass procedures (78) to the anterior tibial (38), posterior tibial (26), and peroneal (14) arteries, performed between 1984 and 1986, are analyzed. Sixty-six operations were for limb-threatening ischemic, and 12 were for disabling claudication. A variety of conduits was employed: in situ saphaenous vein in 42 patients, PTFE in 18, nonreversed saphenous vein in nine, reversed saphenous vein in six, arm vein in one, and two received composite grafts. Thirty-five percent of patients were diabetic and 38% had a significant smoking history. There were two postoperative deaths. Thirteen wound complications occurred in 12 patients, and 24 patients suffered 32 other nonfatal complications. Cumulative patency rates by life-table analysis for all grafts at one, two, and three years were 87%, 74%, and 68% respectively. Cumulative limb salvage rates at one, two, and three years were 88%, 84%, and 74% respectively. The patency rates for in situ saphenous vein grafts were 84%, 76%, and 76% at one, two, and three years respectively, with a cumulative 85% limb salvage rate at three years. The one and two year cumulative patency rates of PTFE were 94% and 70%, with 94% and 86% limb salvage. Of six bypasses performed to the dorsalis pedis artery, four were patent at an average of 12 months (range: 3-22 months), and no major amputations were performed. We conclude that good limb salvage can be achieved in these desperate end-stage patients using a variety of approaches to infrapopliteal bypass.

Pleuroperitoneal Shunting for Pleural Effusions

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Tube thoracostomy and chemical pleurodesis, although generally successful in the treatment of pleural effusions, occasionally fails to prevent recurrence. When the lung is prevented from reexpanding by tumor fibrosis, chemical sclerosis is of no value. Decortication to free the trapped lung and parietal pleurectomy to achieve pleural symphysis carry major morbidity and mortality. The pleuroperitoneal shunt offers the advantage of a simple and safe procedure and short hospitalization. We have impanted ten shunts in nine patients during the past two years. One patient had a benign effusion, while eight had cancers of the breast, lung, or cervix. All had failed tube drainage. Eight implantations were performed under local anesthesia and two under general. Three patients had simultaneous placement of peritoneovenous shunts. One patient suffered a cerebrovascular accident thought secondary to heparin-induced thrombocytopenia and thrombosis. No direct shunt-related complications were encountered. All patients achieved symptomatic benefit. Two shunts became clogged by tumor growth at six months and at one month. The patient with a benign effusion has a functioning shunt over one and a half years after placement; the remaining devices remained patent until the patients' deaths from one to 13 months after implantation.

Does Pepsin Contribute to "Stress" Gastritis?

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and IRVIN M. MODLIN, M.D., Department of Surgery, St. Mary's Hospital, Waterbury,
and Yale University School of Medicine.

Stress gastritis is a frequent and often deadly complication of ICU care despite antacids and H_2 blockade. We hypothesized that shock or sepsis could stimulate the release of pepsin, a powerful mucolytic barrier breaker endogenous to the gastric mucosa. Pepsin, pH, and occult blood were measured in gastric aspirates from critically ill patients (n=20) and matched routine postoperative patients (n=20), all of whom were receiving antacids and H_2 blockers. Pepsin was measured by 125I-albumin assay. The pathophysiology of pepsin release was further explored in isolated guinea pig fundic mucosa mounted in Ussing chambers and exposed to graded concentrations of endotoxin (n=8) and varying oxygen tensions (n=18). Pepsin and acid secretion, potential difference (PD) and electrical resistance (R) were measured while tissue morphology was evaluated by light and transmission electron microscopy. Intragastric pH did not differ between the two patient groups. Fifty percent (p=0.58) of ICU patients had heme + gastric juice as compared to 10% of control patients ($p<0.01$). Pepsin levels were 5,490±1,701 in ICU patients and 315±101 in control patients ($p<0.0001$) Pepsin levels correlated with occult blood (r=0.59, $p<0.001$); pH did not (r=0.04, p=0.81). In isolated mucosae, endotoxin (endo) and hypoxia both inhibited acid secretion and PD but increased pepsin release and R.

Histologic study demonstrated decreased luminal microvilli and scattered cytoplasmic vacuolization with islands of cell death in hypoxic and endotoxin-treated tissues with more widespread necrosis in anoxic tissues. Thus, gastric mucosa damaged by stress appears to release massive quantities of pepsin. This may stem from pathologic alterations in membrane integrity rather than physiologic exocytosis. Increases in concentration of this powerful proteolytic enzyme in the gastric juice of critically ill patients may contribute to "stress" bastric lesions and explain the relative inadequacy of antacid and H2 blocking prophylaxis for this disease.

Free Tissue Transfer Following Revascularization for Limb Salvage in the Diabetic Foot

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Reconstruction of major soft tissue defects in the diabetic lower extremity is often severly limited by the quality of local tissue and regional blood supply, frequently offering no good alternative to limb amputation. Disease of the opposite extremity obviate the use of cross leg flaps, and major vascular disease of the ipsilateral extremity may preclude free tissue transfer.

Microvascular free tissue transfer following limb revascularization in diabetics with major lower extremity defects may offer an alternative to amputation in selected patients.

We recently treated a 60-year-old white diabetic male six months after a successful left femoral popliteal bypass for severe occlusive disease. This patient was admitted with a plantar cellulitis and ulceration of the bypassed extremity, requiring surgical debridement which resulted in an 8 cm by 11 cm full thickness defect with exposed metatarsals on the weight bearing portion of his left foot. Because of severe contralateral limb disease, cross leg reconstruction was not suitable, and free tissue transfer was offered as an alternative to amputation.

Successful reconstruction was accomplished with a free radial forearm fasciocutaneous flap harvested from the left forearm, utilizing the dorsalis pedis artery as the recipient.

The patient was discharged with nonweight-bearing ambulation four weeks postoperatively and began weight bearing seven weeks postoperatively. Follow-up is now 12 weeks without flap breakdown or morbidity.

There are 13 cases of microvascular flaps and distal arterial bypasses previously reported on the literature with a 90% limb salvage rate. Donor flaps should be harvested from the upper body where the vasculature is less diseased in the diabetic. Recipient vessels can be evaluated intraoperatively with pressure measuring or preoperatively by doppler studies and wave form analysis.

Free tissue transfer is an acceptable alternative to amputation for major defects in the ischemic diabetic extremity following revascularization. The possibility of post-bypass reconstruction with free flaps may broaden the indications for revascularization in these challenging patients.

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AIR FORCE

Important Advances in Clinical Medicine

Internal Medicine

The Scientific Board of the California Medical Association presents the following inventory of items of progress in internal medicine. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist busy practitioners, students, research workers, or scholars to stay abreast of these items of progress in internal medicine that have recently achieved a substantial degree of authoritative acceptance, whether in their own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on Internal Medicine of the California Medical Association and the summaries were prepared under its direction.

Fungal Sinusitis in Immunocompetent Patients

SINUSITIS is a common problem in otherwise healthy persons, especially those with atopic disease. The most common etiologic agents are bacteria and viruses. Less commonly, sinusitis may be caused by a variety of fungi. Fungal sinusitis in an immunocompromised patient is often a fulminant life-threatening disease and is most commonly caused by *Aspergillus* species or the agents of mucormycosis (zygomycosis). In an immunocompetent patient, fungal sinusitis is usually chronic and is diagnosed when surgical treatment is carried out in patients who have not responded to antimicrobial therapy for presumed bacterial sinusitis. Therefore, the possibility of fungal sinusitis should be considered in patients with sinusitis unresponsive to appropriate antibacterial therapy.

Three categories of fungal sinusitis have been described: invasive, chronic noninvasive, and allergic. Invasive disease is characterized by local extension with necrosis of soft tissue and bone and most commonly occurs in immunocompromised patients. Noninvasive sinusitis is typified by the presence of a "fungus ball" in one or more of the paranasal sinuses. A local inflammatory response without tissue destruction results. *Aspergillus* species are the most common causes of noninvasive fungal sinusitis. The diagnosis and treatment of this condition are primarily surgical; antifungal therapy probably has no role. Allergic sinusitis is also caused primarily by *Aspergillus* and is found in patients with asthma and recurrent sinusitis. Histologic examination of the sinuses reveals mucus containing fungal hyphae as well as eosinophils and Charcot-Leyden crystals. Whether this disorder is distinct from noninvasive sinusitis is not completely established.

More recently, the dematiacious (pigmented) fungi have also been associated with sinusitis. These include *Bipolaris* (formerly called *Drechslera* or *Helminthosporium*), *Exserohilum, Curvularia,* and *Alternaria.* Patients frequently have atopic disease, such as hay fever and nasal polyposis, but are otherwise healthy. The most common symptoms are chronic nasal discharge or obstruction that has not responded to antibacterial agents or nasal corticosteroids. Sinus radiographs and computed tomography show sinus opacification without an air-fluid level. A computed tomographic scan sometimes shows local bony destruction. Fungal hyphae are found in the mucus from surgical specimens and, less commonly, bone invasion, necrosis, or both are found. Thus, this disorder overlaps all three classes of fungal sinusitis mentioned earlier. Although primarily a noninvasive disease, there may be local invasion, and patients frequently give a history of allergic symptoms. The prognosis is variable. In a few patients, cerebral extension develops despite surgical and antifungal therapy. Some have required several surgical procedures to stabilize their disease, but others have apparently been successfully treated with a single surgical procedure.

Until more is known about the natural history of sinusitis caused by the pigmented molds, these patients should probably be treated with antifungal therapy in

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addition to surgical debridement. Amphotericin B is the most effective agent currently available, and ketoconazole has some in vitro activity. Itraconazole, an investigational triazole, shows good in vitro activity against these fungi and may prove to be a satisfactory oral agent for treating patients with chronic fungal sinusitis.

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Continuous Estrogen-Progestin Therapy in Postmenopausal Women

ESTROGEN replacement therapy in postmenopausal women has been widely advocated for the relief of climacteric complaints and the prevention of osteoporosis. In addition, the use of standard doses of conjugated estrogen (0.625 mg) has been shown to increase high-density-lipoprotein (HDL) cholesterol levels by about 15% and is associated with a relative risk for cardiovascular disease of 0.2 to 0.7 compared with that of nonusers. At present, contraindications for postmenopausal estrogen replacement are personal history of breast cancer, endometrial cancer, or deep venous thrombosis. An adverse effect of estrogen therapy is endometrial hyperstimulation, which can lead to hyperplasia and eventually carcinoma. The relative risk estimates for endometrial cancer associated with estrogen replacement range from 2 to 12, depending on the duration of estrogen use and the cumulative dose. The incidence of endometrial hyperplasia in patients receiving continued unopposed estrogen therapy is 15% to 50%, but this can be reduced to zero if progesterone is added for at least ten days each month. The duration of progestin treatment each month is more important than the dose in preventing endometrial hyperplasia. The progestational side effects appear to be more dose-dependent and include symptoms like abdominal bloating, headache, depression, and acne. Another serious effect is a reduction in the beneficial effect of estrogen on the HDL cholesterol.

A standard regimen for hormone replacement therapy has been the cyclic administration of estrogen and progestin. A new approach has recently been introduced involving the use of continuous combined treatment. Four studies have looked at the daily use of estrogen—conjugated equine estrogen, 0.625 mg, or estradiol valerate, 2mg—and a low-dose progestin, such as medroxyprogesterone acetate, 2.5 to 5 mg, or norethindrone, 0.35 to 2 mg, in 148 postmenopausal women observed for 3 to 18 months. These treatments were consistently shown to produce amenorrhea with an inactive endometrium, while alleviating climacteric symptoms. The amount of breakthrough bleeding tended to decrease with the increasing doses of progestin used. Most of the bleeding occurred during the first four months of treatment, and by the ninth month spotting was uncommon regardless of the dose used. It is reassuring that despite breakthrough bleeding, no endometrial hyperplasia was found during continous treatment in any of the women studied. Two short-term trials using daily conjugated equine estrogen, 0.625 mg, and medroxyprogesterone acetate, 2.5 mg, showed either no change in lipoprotein levels or a statistically significant decrease in total and low-density-lipoprotein cholesterol levels from pretreatment values.

The optimal formulation for daily hormonal therapy in postmenopausal women is still unknown. It seems reasonable to initiate treatment with one of the combinations already studied, like conjugated estrogen plus low-dose medroxyprogesterone acetate. After several months the progestin dose may be adjusted, either downward to the lowest dose that maintains amenorrhea, or upward if breakthrough bleeding occurs. If bleeding persists on a higher dose, it would be prudent to do a gynecologic evaluation and possible endometrial biopsy. If breakthrough bleeding is minimal after a few months of treatment, standard guidelines for routine pelvic examinations and Pap smears could be followed. If larger studies continue to show a complete suppression of endometrial proliferation on continuous combined therapy, there should be no need to do regular endometrial biopsies on these patients. There are many other issues to be considered in the management of perimenopausal women who still have cyclic bleeding, but these will not be discussed here.

In summary, the use of a daily combination of estrogen with a very-low-dose progestin may be an easy, convenient, and safe way to provide hormone replacement in postmenopausal women. This treatment seems preferable to conventional therapy because it avoids cyclic bleeding and reduces progestational side effects while protecting the endometrium. It may also prevent the climacteric symptoms that some women experience during the period of estrogen withdrawal. Larger long-term studies are still needed to document that the benefits of adding continuous low-dose progestin to estrogen replacement outweigh the risks.

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Ganciclovir for Cytomegalovirus Retinitis

RETINITIS is the most common manifestation of cytomegalovirus (CMV) disease in immunocompromised patients, especially those with the acquired immunodeficiency syndrome (AIDS). Although CMV infection can cause disease at other sites, such as the esophagus, colon, and central nervous system, the retina is the most commonly involved site in patients with AIDS. Although CMV infection is an unusual index AIDS diagnosis, this infection will develop in 5% to 10% of patients at some time during the course of the disease. Lengthened survival due to improved antiretroviral chemotherapy and the suppression of *Pneumocystis carinii* pneumonitis will doubtless increase the incidence of other opportunistic infections such as CMV.

Ganciclovir has recently been approved by the Food and Drug Administration for the treatment of life-threatening CMV retinitis. It is a nucleoside analogue like acyclovir. Clinical trials with ganciclovir began in 1984, and clinicians (especially those caring for AIDS patients) quickly came to the conclusion—in the absence of prospective, comparative studies—that the drug was effective. It was not until several years later, however, that a series of prospective and retrospective clinical trials provided convincing evidence of efficacy.

Ganciclovir is currently recommended for the treatment of sight-threatening CMV retinitis. Patients with this disease have visual symptoms, and retinoscopy shows the typical changes of CMV retinitis—perivascular hemorrhages and whitish "exudates" (actually, necrotic retinal tissue). Asymptomatic patients with rapidly progressive retinitis moving toward the macula may also warrant treatment. Therapy for patients with asymptomatic, nonprogressive or slowly progressive peripheral CMV retinitis or those with end-stage (blinding) retinitis in one eye is still controversial. It is not yet clear that the benefits of long-term ganciclovir therapy exceed the risks of toxicity in such patients.

Treatment with ganciclovir is traditionally divided into two phases: the initial treatment phase—usually called the "induction" phase, by analogy with cancer chemotherapy—and the later phase of long-term chemosuppression, usually called the "maintenance" phase. The drug is always given intravenously. The induction dose is 5 mg per kg of body weight given every 12 hours for 14 days; the dose needs to be reduced for patients with renal insufficiency. All patients receiving induction should be placed on a maintenance dose of the drug, the risk of relapse being virtually 100% for those not treated; most experts recommend 5 to 6 mg per kg a day, given once daily five to seven days per week. Both the latter part of the induction phase and the maintenance phase can be given at home. Patients should be monitored fortnightly by an ophthalmologist.

The principal toxic effect of ganciclovir is neutropenia. Dose-limiting neutropenia will develop in about 10% of patients during induction and in 20% during the maintenance phase. We recommend discontinuing therapy if the absolute neutrophil count falls to 500 X 10^6 per liter. After the granulocyte count returns to baseline, many patients can tolerate a reduced dose. Synergistic toxicity with zidovudine (AZT) is nearly universal , and only a small proportion of patients will be able to tolerate even reduced doses of AZT with maintenance ganciclovir. Other adverse effects, such as thrombocytopenia, hepatitis, eosinophilia, nausea and vomiting, confusion, and rash, are less common and are rarely dose limiting.

As the first drug effective against CMV disease, ganciclovir is a major therapeutic breakthrough, but it is toxic, dose-limiting adverse reactions are common, and it must be given by intravenous infusion. Therapy with this drug should therefore be reserved for patients with sight-threatening CMV retinitis.

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Monitoring Sodium Warfarin Therapy Using the International Normalized Ratio

THE prothrombin time (or prothrombin ratio), the time-honored test used to monitor the anticoagulant effect of sodium warfarin therapy, is gradually being supplemented or replaced by a new measure, the international normalized ratio (INR). The use of the INR is being adopted because the thromboplastin reagents used in different laboratories to measure the prothrombin time may have significantly different sensitivities to warfarin-induced changes in vitamin K-dependent clotting factors. The prothrombin time results from two different laboratories on a single specimen of plasma may show a difference in the measurement as great as two to three seconds! Thus, a patient who has an apparently "therapeutic" prothrombin time measurement in one laboratory may have a nontherapeutic prothrombin time result in a different laboratory.

Conceptually, the INR standardizes the prothrombin time measurements by taking into account the sensitivity of the thromboplastin reagent being used. Mathematically, the INR = $(PR)^{ISI}$, where the PR is the prothrombin ratio—a patient's prothrombin time divided by the control prothrombin time—and the exponent is the international sensitivity index (ISI) of the reagent. Thus, the INR is identical to the prothrombin ratio when the ISI is 1.0. In Great Britain, where human brain thromboplastins are used, the ISI values are close to 1.0, but in the United States, where rabbit brain thromboplastins are used, ISI values are notably higher, in the range of 1.9 to 2.6.

Recently published guidelines for managing oral anticoagulant therapy define optimal therapeutic target ranges using INR units. Most thromboembolic disorders can be successfully treated using "low-intensity" oral anticoagulation therapy, with the INR between 2.0 and 3.0. These conditions include the treatment of deep vein thrombosis and pulmonary embolism; the prevention of venous thromboembolism in patients undergoing a high-risk surgical procedure; and the prevention of systemic embolization in patients with tissue heart valves, valvular heart disease, atrial fibrillation, and after an acute myocardial infarction. "High-intensity" anticoagulation therapy, with the INR between 3.0 and 4.5, is necessary to prevent systemic embolization in patients who have a mechanical prosthetic heart valve and to treat patients who have a thromboembolic complication while on low-intensity therapy.

If a clinical laboratory does not provide the INR value with each prothrombin time, it is possible to determine it by requesting the ISI value of the thromboplastin reagent and finding the INR value on a published nomogram. (The INR value can also be easily calculated using a pocket calculator equipped with logarithmic and exponential functions.) If the ISI of the thromboplastin reagent is unknown, there is no way to calculate the INR value. Assuming that a thromboplastin reagent has an ISI value of 2.4 and that the control prothrombin time is 12 seconds, the low-intensity INR range of 2.0 to 3.0 is equivalent to a prothrombin time between 16 and 19 seconds, and the high-intensity INR target range of 3.0 to 4.5 is equivalent to a prothrombin time between 19 and 22.5 seconds.

The widespread use of the INR will allow a direct comparison of results from different clinical laboratories, but it will undoubtedly take time for clinicians to become familiar with INR units, particularly the fact that for any change in a patient's coagulation status, the INR will change more than the prothrombin time. For example, if the ISI of a thromboplastin reagent is 2.4, an increase in the prothrombin time from 18 to 24 seconds more than doubles the INR value, which rises from 2.6 to 5.2. Although using the INR will require some adjustment, it is certainly a step in the right direction of achieving better control of anticoagulation therapy.

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Medical Treatment of Breast Cancer

THE management of carcinoma of the breast has been under intense review for the past decade and has been the source of several well-constructed, multi-institutional clinical trials. As data from these trials have matured, they have changed the practice of cancer management.

Recently eight-year follow-up data have been presented on the recurrence patterns and survival rates of breast cancer patients randomly assigned to lumpectomy alone, lumpectomy with local x-ray therapy, or total mastectomy. For the three treatment groups there were no differences in overall survival or patterns of distant metastatic disease. Disease-free survival rates, excluding patients receiving lumpectomy in whom local x-ray treatment failed, also did not differ. These data offer the longest follow-up for a prospective study and provide an increasingly firm base for using less extensive surgical intervention in the primary management of breast cancer. In other published studies, the systemic use of chemotherapy or tamoxifen in patients with breast cancer without malignant nodes was shown to offer a survival advantage.

These trials in toto document the current trend of less extensive primary surgical therapy for breast cancer but with the use of systemic therapy beginning just after surgical treatment for most, if not all, patients. The data supporting the use of systemic adjuvant therapy for both patients with and without nodes showing malignant tumor must, however, be interpreted conservatively and with due attention to patient and clinical staging characteristics of those populations being reported.

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The Use of CPAP to Eliminate Obstructive Sleep Apnea

CONTINUOUS positive airway pressure (CPAP) applied through the nares is now the preferred treatment of clinically significant obstructive sleep apnea. Patients who use CPAP wear a mask that surrounds the nose and is secured by straps that fit around a patient's head. A long hollow tube is connected to a flow generator that initiates air flow at levels defined by a sleep study evaluation.

Continuous positive airway pressure is used to treat obstructive sleep apnea, which is characterized by an upper airway obstruction that impedes ventilation during sleep. Apnea is defined as the cessation of breathing of at least ten seconds' duration and may be caused by the collapse of redundant tissues in the upper airway, which is common in obese patients. In the absence of air flow, arterial oxygen levels fall and may be accompanied by a brain arousal or awakening—a two- to three-second electroencephalographic (EEG) disturbance. The large number of EEG arousals seen in these patients probably leads to the excessive daytime sleepiness that they have.

Nasal CPAP was first described in 1981 and gained pervasive acceptance in the sleep disorders community by 1986. Before CPAP, an upper airway operation, uvulopalatopharyngoplasty (UPPP), was the preferred therapy for patients with relatively severe sleep apnea. Unfortunately, UPPP has proved to be of limited success as only 45% of the patients had improved apnea indexes. Furthermore, patients with UPPP without tracheostomy did not fare better than control subjects when tested over a seven- to eight-year time frame after the operation. Nasal CPAP was revolutionary because it was less invasive and, when patients used it nightly, more effective than the operation. Patients using CPAP had no obstructive sleep apnea and a 100% survival rate over a seven- to eight-year period after the operation.

It is thought that nasal CPAP eliminates both snoring and obstructive sleep apnea by creating a pneumatic splint in the airway so that the airway remains patent during sleep. When nasal CPAP is applied at the appropriate levels—5 cm to 20 cm of water—arterial oxygen saturation levels improve and fewer EEG sleep arousals are noted. Within a short time—one day in some cases—patients may show a dramatic lessening of the severity of daytime sleepiness. The long-term use of CPAP is required unless the patient can lose enough weight to reverse the obstructive sleep apnea.

Patients who have an apnea index (number of apneas per hours of total sleep time) above 20 in our experience are the most tolerant of CPAP. Estimates from studies conducted at various centers around the world indicate that CPAP is well tolerated. Tolerance estimates range between 60% and 80% and are thought to be increased with close follow-up. Intolerance to CPAP is usually caused by nasal congestion, claustrophobia, or excessive CPAP pressure levels.

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New Dietary Concepts in Hypercholesterolemia

HYPERCHOLESTEROLEMIA increases the risk for coronary artery disease. This risk rises progressively with increasing cholesterol levels, especially with levels above 5.20 mmol per liter (200 mg per dl). More than half of adult North Americans have cholesterol levels in excess of 5.20 mmol per liter. Lowering serum cholesterol levels will reduce the incidence of coronary artery disease. Dietary modification to lower the consumption of cholesterol and total and saturated fats remains the mainstay of therapy.

Additional dietary concepts have recently become popular. One is the use of water-soluble fibers, found in oat bran, beans, and fruit pectin, to reduce total and low-density-lipoprotein (LDL) cholesterol levels. Eating oat bran, an inexpensive, palatable fiber, can lower total cholesterol levels by 3% to 26%; LDL cholesterol levels also decrease, but high-density-lipoprotein (HDL) cholesterol and triglyceride values usually remain unchanged. Most studies are short-term (3 to 12 weeks), but one showed persistent benefit to 99 weeks. Another soluble fiber, psyllium, used to regulate bowel function, also lowers total and LDL cholesterol levels. The long-term effects of soluble fibers on the incidence of coronary artery disease are unknown.

Soluble fibers are thought to lower serum cholesterol levels by binding bile salts in the intestine. In response, the liver increases its conversion of cholesterol to bile acids. The depletion of the liver cholesterol content stimulates a synthesis of LDL receptors, a primary mechanism for removing LDL cholesterol from serum. The addition of soluble fibers such as oat bran to a low-fat, low-cholesterol diet may be an inexpensive nonpharmacologic way to help reduce serum cholesterol levels.

Another dietary theory proposed that the type of fat injested may play a more important role in determining serum cholesterol levels than the amount. People in Mediterranean countries who eat a diet high in total, predominantly monounsaturated fat have a low incidence of coronary artery disease. Short-term studies have compared the effects on serum lipids of volunteers who ingested diets high in total and monounsaturated fat, high in total and saturated fats, or low in total fat. The high-monounsaturated-fat and low-fat diets had similar effects in lowering total and LDL cholesterol levels when compared with the high-saturated-fat diet. These study diets differed from Mediterranean diets. They used liquid formulas low in complex carbohydrates, high in glucose, and high in safflower oils rather than olive oil. The long-term effects on serum lipids of diets high in total and monounsaturated fat have not been studied. It is premature to conclude that such a diet will lower the incidence of coronary artery disease. The current recommendations for North American adults include a small increase in monounsaturated fat consumption to partially replace decreased saturated fat intake.

What about fish oils, the w-3 fatty acids? Pharmaceutical sales of fish oil capsules have dramatically increased. Interest developed when it was noted that coastal Eskimos and other populations whose diets are rich in these substances have a low incidence of coronary artery disease. Even in large quantities, w-3 fatty acids cause only a modest decrease in serum cholesterol levels; they primarily lower triglyceride levels. They also decrease platelet aggregation and the synthesis of thromboxane A_2, factors implicated in the pathogenesis of atherosclerosis.

Whether ingesting w-3 fatty acids will reduce the incidence of coronary artery disease is unknown. Patients should be informed that the typical North American diet, high in saturated fat, cannot be turned into an "Eskimo diet" by added fish oil capsules. Eskimos have a high incidence of stroke, and there is concern this may be related to the hemostatic alterations of w-3 fatty acids. To match the Eskimo diet in w-3 fatty acids would require using as many as 30 to 60 capsules per day, with an average daily cost of $10. The use of fish oil capsules is not recommended. Epidemiologic evidence suggests that the frequent consumption of fish, whether high or low in w-3 fatty acids, is associated with a decreased risk of coronary artery disease. Fish can provide a useful substitute for meat high in saturated fat.

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Recent Advances in Diagnosis and Treatment of Acute Pancreatitis

ACUTE pancreatitis is a commonly encountered clinical disorder. In the United States, alcohol abuse and biliary tract disease account for the vast majority of cases. Morbidity and death related to pancreatitis are largely confined to patients with severe necrotizing disease, which accounts for 10% to 18% of cases.

The diagnosis of pancreatitis is made clinically because histologic examination of the gland is not readily available. The clinical diagnosis may be supplemented or supported by laboratory or radiographic evidence. Efforts to improve either the sensitivity or specificity of the diagnosis with specific enzyme or isoenzyme measurements have been largely unsuccessful.

Although diagnostic imaging of the gland may be confirmatory, both ultrasonograms and computed tomograms may be normal in as many as 15% to 20% of patients with acute pancreatitis. The most useful role of computed tomography is in its ability to provide prognostic information and identify complications—abscess or pseudocyst—of pancreatitis. The use of magnetic resonance imaging in acute pancreatitis remains a research tool. Its poor spatial resolution makes it unreliable in differentiating inflammation from necrosis and other pancreatic abnormalities.

The treatment of acute pancreatitis is primarily supportive because most cases are of mild or moderate severity and have a universally good prognosis. Such patients need only be supported with fluid resuscitation and adequate analgesia. Nasogastric suction, H_2-receptor blockers, atropine, glucagon, aprotinin, and antibiotics have all proved ineffective in improving the outcome in patients with mild to moderate disease, and their use is not recommended.

Early morbidity and death in pancreatitis are related to cardiopulmonary collapse and renal failure, which occur in patients with severe necrotizing or hemorrhagic pancreatitis. Although clinical trials of the use of peritoneal lavage have failed to show an improvement in mortality, lavage may offer a means of support for those with cardiovascular collapse.

Although early death may not be avoided, late mortality may be prevented. Death after 10 to 14 days occurs as the result of septic complications. Controlled trials have shown that the prophylactic use of antibiotics is of no benefit in improving outcome, but these studies are flawed in that the population studied was at low risk (nonsevere pancreatitis). A growing body of literature suggests that bacterial contamination occurs more frequently—in 40% of cases—and earlier (seven to ten days) than previously assumed in patients with severe necrotizing pancreatitis. In this population, antibiotic prophylaxis may be beneficial.

Unfortunately, a case of sterile necrosis cannot be clinically differentiated from a case of infected necrosis. In both, patients may have fever, leukocytosis, and a clinically deteriorating course. Computed tomography-guided aspiration of necrotic areas or liquid collections has proved to be a reliable means of detecting or excluding bacterial infection. The presence of organisms on a Gram's stain or a culture requires either aggressive surgical debridement or radiologic catheter drainage.

Using an aggressive aspiration approach in patients with severe necrotizing pancreatitis and early operative or catheter drainage may result in improved survival rates. The use of prophylactic antibiotics in these patients should be evaluated by a controlled trial.

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Misoprostol Therapy for Patients Taking Nonsteroidal Anti-inflammatory Drugs

GASTROPATHY induced by the use of nonsteroidal anti-inflammatory drugs (SAIDs) is a major complication of these widely prescribed drugs. Patients at highest risk for gastropathy are those on long-term NSAID therapy, including the elderly, arthritic patients, and those with a history of abdominal pain or gastric intolerance to NSAIDs. The spectrum of gastropathy includes mucosal hemorrhages or erosions, gastric ulcer—present in as many as 15% of the population at risk—and duodenal ulcer, and any of these may present with complications such as gastrointestinal bleeding or perforation. Attempts to prevent NSAID-related gastropathy with H_2-receptor blockers and sucralfate have been unsuccessful, though these agents remain useful for healing established ulcers once NSAID therapy is discontinued.

The mechanism of NSAID-induced mucosal damage is not completely understood. The suppression of mucosal prostaglandin production and a reduction of mucosal blood flow by NSAIDs are contributing factors, and the presence of gastric acid is required. Prostaglandins such as misoprostol, a synthetic prostaglandin E_2 analogue, have been investigated for their role in gastric mucosal protection, particularly against insults such as from taking NSAIDs. In low doses these agents have cytoprotective properties such as enhancing mucosal blood flow and gastric mucous production. In higher doses they can inhibit gastric acid secretion. In healthy subjects misoprostol use has been shown to prevent mucosal lesions induced by NSAIDs and aspirin. Even with doses below antisecretory levels, patients had lowered endoscopic scores of mucosal damage, suggesting cytoprotection by misoprostol. Notably, abdominal pain and other gastrointestinal symptoms were not reduced in these short-term studies.

Two recent trials show the clinical usefulness of misoprostol in arthritic patients on NSAID therapy. One trial enrolled patients with abdominal pain but without gastric ulcers on endoscopy and showed a significantly reduced incidence of gastric ulcer in the group treated with misoprostol. Because the overall incidence of gastric ulcer was high, the study was terminated for ethical reasons before statistically significant data could be collected on the effects on duodenal ulcers. In a second study, misoprostol therapy produced substantial regression of gastropathy in patients with rheumatoid arthritis who continued on aspirin therapy. No exacerbation of arthritis symptoms was noted in patients treated with misoprostol.

Unfortunately, none of these studies have shown any consistent benefit on abdominal symptoms; in fact, some have shown worsened gastrointestinal symptoms in the misoprostol-treated patients. This is due in part to the side effects of the drug, which include diarrhea, dyspepsia, and abdominal pain, and may require reducing the dose from the recommended starting dose of 200 μg four times a day to 100 μg. Misoprostol also has uterotonic effects and may cause cramping, bleeding, or spontaneous abortion, necessitating extreme caution in prescribing to women of childbearing age and contraindicating its use in pregnancy.

Misoprostol therapy should certainly be considered for patients with disabling arthritis who need to continue on NSAID therapy despite a serious complication—such as gastric ulcer or gastrointestinal bleeding—from these agents. It may be indicated in symptomatic patients on NSAID therapy, particularly elderly or chronically ill persons, to prevent the development of gastric complications. Because its efficacy in reducing symptoms has not been shown, assessing any clinical benefit over the short term may be difficult, especially because many of these patients will not be followed up with endoscopy. The role of misoprostol therapy in high-risk asymptomatic patients without documented gastrointestinal complications bears further investigation. Its effects on the prevention and healing of duodenal ulcers need to be assessed. Finally, long-term studies are needed to evaluate the efficacy of misoprostal therapy in preventing more serious complications such as gastrointestinal bleeding and perforation and to identify the patient groups that may benefit from such therapy.

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Rheumatoid Arthritis and Methotrexate—A Renewed Partnership

METHOTREXATE was first used to treat hematologic malignant disorders in the late 1940s. It was later tried in rheumatic diseases with the assumption that the two groups of patients shared a similar pathophysiology. Because of the serious side effects associated with the earlier dosage regimens and the recognition of the dramatic effects of corticosteroids, its use was soon discarded. The modern application of methotrexate began in the 1960s when introduced in the treatment of psoriasis and dermatomyositis.

Since 1980 when an eight-year experience with the use of methotrexate to treat rheumatoid arthritis was described, several authors have published data supporting the relative safety and efficacy of its use in patients with this disorder. In 1988 the American College of Physicians published a "possible paper" describing its use, and this year, after 45 years on the market, the Food and Drug Administration approved its use for the treatment of rheumatoid arthritis.

Methotrexate is a folic acid analogue. It inactivates intracellular enzymes, depleting the cell of reduced folates necessary for the formation of purines and pyrimidines and thus DNA. Its mechanism of action in rheumatoid arthritis is unknown but would appear to include anti-rheumatic and anti-inflammatory properties. Specific actions described include the suppression of neutrophil chemotaxis and the enhancement of the function of killer cells. Administering leucovorin calcium can reverse clinical improvement, suggesting folate antagonism as a mechanism. No effect on prostaglandins has been reported.

The use of methotrexate should be considered when more traditional methods of treating rheumatoid arthritis, such as gold therapy, have failed. Although the accumulated data suggest that methotrexate as primary therapy may be recommended in the future, long-term follow-up information is not yet available to support the safety of this approach. Moreover, methotrexate has not yet been proved to induce true remissions in these patients. Severe flares of rheumatoid arthritis after discontinuing therapy have been reported.

Because of the potentially severe side effects, candidates for therapy must be selected carefully and monitored continuously. Contraindications include the presence of infection, hepatic disease, alcohol intake, or reduced renal function as estimated by an age-adjusted creatinine clearance. Relative contraindications include either hematologic abnormalities unrelated to rheumatoid arthritis or interstitial lung disease.

The baseline evaluation should include a complete blood count, blood chemistry values, a urinalysis, and a chest roentgenogram in all patients. Regularly scheduled monthly visits with a physician familiar with the drug and a redetermination of blood count and liver function indexes are prudent. The necessity of doing a liver biopsy is controversial, but most reports suggest a biopsy after a cumulative dose of 1,500 mg. Current practice based on accumulated experience is to do a biopsy only if liver enzyme levels remain evaluated after stopping the drug. When evaluating a biopsy specimen, the awareness that pretreatment histologic abnormalities have been reported should be kept in mind. Pulmonary function should be assessed if respiratory symptoms develop because methotrexate toxic effects include interstitial pneumonitis. The initial dose is 7.5 mg one day per week with the maximal dose seldom exceeding 15 mg.

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Thrombolytic Therapy for Acute Myocardial Infarction

ADMINISTERING thrombolytic drugs to patients with acute myocardial infarction results in clot lysis and reperfusion of the occluded coronary artery in about

35% to 75% of patients. Successful reperfusion results in enhanced survival and improved left ventricular function, most likely owing to a decrease in infarct size. Furthermore, a reperfused infarct is less likely to undergo remodeling and expansion, resulting in less deterioration of left ventricular function in the days and weeks after infarction. Most trials have shown that initiating thrombolytic therapy early—within three hours after chest pain begins—improves the success of thrombolysis and survival compared with the results of giving thrombolytic therapy relatively late after the onset of chest pain. The Second International Study of Infarct Survival (ISIS-2) trial, however, showed that intravenous streptokinase therapy lengthened survival, even when given 12 to 24 hours after the start of symptoms. This may have been due to the presence of collateral circulation in certain patients, possibly delaying the time after which irreversible myocardial injury occurred. Alternatively, this may indicate that later reperfusion after a completed infarction may be of benefit by preventing infarct expansion. Many of the initial thrombolytic trials emphasized that the major improvement in survival occurred in patients with anterior myocardial infarctions. A trial from New Zealand, however, and the ISIS-2 trial showed that thrombolytic therapy improved survival rates in patients with inferior myocardial infarctions as well.

The possible benefits of coronary reperfusion in patients with acute myocardial infarctions need to be weighed against the side effects of thrombolytic therapy. The most serious side effect of thrombolytic therapy is intracranial bleeding, which occurs in about 0.5% of patients. Other side effects include bleeding from other sites, hypotension, and reperfusion arrhythmias. Streptokinase also has the potential to cause allergic reactions and, rarely, anaphylaxis. Risk factors that would preclude a patient from receiving thrombolytic therapy include the presence of active internal bleeding, a history of a previous cerebrovascular accident, neurosurgical procedure or head trauma, an intracranial neoplasm, an atrioventricular malformation or aneurysm, and a known bleeding disorder. Investigators have excluded patients older than 75 years from receiving thrombolytic therapy because of a perceived increased risk for intracranial bleeding. The ISIS-2 trial, however, showed no increased risk for intracranial bleeding following intravenous streptokinase therapy in patients older than 75 years. Further studies will be necessary to confirm this observation.

Because thrombolytic therapy fails to lyse coronary thrombi in about 25% of patients, coupled with the observed and perceived risks of coronary reocclusion and reinfarction, many investigators have examined the possible role of adjuvant pharmacologic therapy and mechanical reperfusion in patients receiving thrombolytic therapy. The ISIS-2 trial showed that using aspirin reduced mortality by 21% in patients with suspected myocardial infarctions. This reduced mortality was additive to that due to intravenous streptokinase therapy. Aspirin use also decreased the incidence of reinfarction in patients receiving intravenous streptokinase by approximately 50%. The Thrombolysis in Myocardial Infarction (TIMI) phase IIB trial found that the early administration of metoprolol reduced the incidence of recurrent angina compared with late metoprolol administration, starting on day 6 after an infarction. Furthermore, when given within two hours of the beginning of chest pain, metoprolol therapy reduced the combined incidence of nonfatal reinfarction and mortality. In patients with persistent coronary artery stenosis, coronary angioplasty done immediately after thrombolytic therapy results in increased complications and mortality compared with delayed angioplasty—that is, done one to seven days after an infarction. Furthermore, the TIMI phase IIB trial showed that doing angioplasty one to two days postinfarction failed to improve survival or left ventricular function or to reduce the incidence of reinfarction compared with conservative management in these patients. Thus, it appears that most patients receiving thrombolytic therapy can be successfully managed without the need for routine coronary angioplasty unless they have symptoms or objective evidence of recurrent ischemia.

At this time there are no definitive data that would show the superiority of one thrombolytic agent over another in terms of improving survival or left ventricular function in patients with acute myocardial infarction. Although the TIMI phase I trial showed that, compared with streptokinase therapy, administering intravenous tissue plasminogen activator achieved a higher incidence of coronary artery patency 90 minutes after it was started, a New Zealand trial failed to show that giving tissue plasminogen activator was better than administering streptokinase in improving overall left ventricular function. It should be noted that both of these trials involved relatively small numbers of patients. Currently there are several large ongong studies comparing the relative benefit of various thrombolytic agents on survival.

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Reducing Morbidity and Mortality Due to Asthma

DESPITE major advances in the understanding of its pathogenesis and the availability of a large number of drugs, morbidity and mortality due to asthma appear to be on the rise. Although the reasons for this disturbing paradox are unclear, there are certain broad treatment guidelines that, if diligently followed, will help to reduce the growing menace of asthma.

Although patients of any age, sex, and race can die of asthma, the disease more frequently ravages socioeconomically handicapped members of the society. In the United States blacks have a higher incidence of death from asthma than whites. Adults older than 65 years and children between the ages of 10 to 14 years are particularly susceptible. Persons with specific immunoglobulin E antibodies to common inhalant allergens are at an increased risk for acute severe attacks of asthma. Most of the patients who die of asthma have a history of severe, poorly controlled disease with poor compliance. Many of these patients also have emotional ailments, particularly depression, isolation, and problems of self-image.

Physicians often fail to realize that there is generally a poor correlation between the symptoms of asthma and the degree of airway obstruction. Patients, on the other hand, commonly develop a tolerance to their symptoms. Thus, there is a failure on the part of both physician and patient to appreciate the severity of bronchial narrowing. Educating patients about recognizing important symptoms and emphasizing the necessity of monitoring airway obstruction by peak flow measurements are the basic steps toward controlling asthma. More often than not, patients can be persuaded to buy a flow meter. Physicians who take care of asthma patients should not only have a peak flow meter on their desk but should also have easy access to a pulmonary function laboratory.

One of the problems related to asthma therapy lies in the way the treatment is delivered to the airways. Although the inhaled route is an effective way of delivering bronchodilators, surveys have shown that more than 50% of patients prescribed an aerosol inhaler used it incorrectly. Furthermore, other studies have revealed that physicians often do a less than satisfactory job instructing their patients on how to use inhalers. The problem of poor coordination can now be corrected by using spacers and newly developed breath-actuated inhalers. These devices are of particular help in very young and elderly patients who find it hard to use metered-dose inhalers.

Although the treatment of asthma should be tailored to the needs of individual patients, inhaled selective β_2-adrenergic agents constitute the first line of therapy in chronic asthma. When a properly administered β_2-adrenergic drug—including the use of spacers and breath-actuated inhalers—does not provide effective relief of bronchospasm, aerosolized corticosteroids should be prescribed to suppress the airway inflammation that appears to underlie the severe bronchial hyperreactivity of asthma. If used effectively, this combination not only produces maximum improvement in peak flow rates but also cuts down the need for parenteral steroids. Patients who do not respond to the β_2-adrenergic drugs and aerosolized corticosteroids combination deserve a trial of cromolyn sodium. This prophylactic agent is particularly useful for young patients with asthma who are known to have allergies and exercise-induced asthma. Recent studies have found that cromolyn sodium reduces bronchial hyperreactivity in adult patients with asthma as well.

In summary, the rising tide of morbidity and death in asthma can be countered by recognizing high-risk patients, by accurately assessing the severity of airway obstruction, by properly delivering bronchodilators in the airway, and by prescribing cromolyn sodium and corticosteroids judiciously.

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Treatment of Small-Cell Lung Cancer

MANY combination chemotherapy regimens have activity in patients with small-cell lung cancer. In contrast to the treatment of non-small-cell lung cancer, surgical excision is not generally recommended for patients with small-cell lung cancer because of the propensity for distant spread of the disease—even if it is not apparent on the initial clinical evaluation— and the excellent initial response to chemotherapy. Patients with both limited stage (disease present only in one side of the thorax and regional lymph nodes) and extensive stage (disease spread beyond the confines of limited disease) small-cell lung cancer have an excellent chance of responding to chemotherapy. Using standard regimens patients with limited disease have a 50% complete remission rate, and approximately 20% of patients with extensive disease will attain a complete remission. A complete remission implies total resolution of all clinical signs and symptoms and radiographic evidence of malignancy. Patients with small-cell lung cancer who achieve a complete remission have an improved quality of life and median survival. Unfortunately, recurrences frequently develop, and the median survivals for patients with limited disease and those with extensive disease are only 12 and 8 months, respectively.

The two most common combination chemotherapy regimens used in the United States for patients with small-cell lung cancer are vincristine sulfate, doxorubicin (Adriamycin) hydrochloride, and cyclophosphamide (VAC) and etoposide and cisplatin. In the past two years, four prospectively randomized clinical trials that tested combinations of these drugs alone and in conjunction with consolidative chest radiotherapy have been reported.

In 1987 the Cancer and Leukemia Group B reported the experience in 399 patients with limited disease who were randomly assigned to receive initial chemotherapy—vincristine, Adriamycin, cyclophosphamide, and etoposide—combined with chest radiotherapy versus delayed chest radiotherapy sandwiched between cycles of chemotherapy versus chemotherapy only. The complete remission rate and median survival were best in the group receiving combined methods. For intial chemotherapy combined with chest radiotherapy, the complete remission rate was 49% and median survival 13.4 months; for chemotherapy plus delayed radiotherapy, the complete remission rate was 58% and median survival 12.0 months; and for chemotherapy alone, the complete remission rate was 36% and the median survival 10.5 months. Disease-free survival was prolonged three to four months for the combined treatment methods.

Two studies were reported from the National Cancer Institute of Canada. In the first, 289 patients with extensive disease were randomly assigned to receive six cycles of VAC or six total cycles of VAC alternating each cycle with etoposide and cisplatin. Patients treated with the alternating regimen had a slightly increased complete remission rate (13% versus 10%) and prolonged median survival (9.6 months versus 8 months). No significant difference in overall survival was detected (P=.4).

The second study from the National Cancer Institute of Canada was undertaken in 300 patients with limited disease. Patients were randomly assigned to receive VAC alternating with etoposide and cisplatin for a total of six cycles, or three cycles of VAC followed by three cycles of etoposide and cisplatin. Again, the alternating regimen resulted in a slight but not significantly different increase in complete remission rate (52% versus 44%) and median survival (15.4 months versus 14.9 months).

In 1988 the Southeastern Cancer Study Group reported the experience in 148 patients with limited disease who were randomly assigned to receive six cycles of VAC or six cycles of VAC followed by two cycles of etoposide and cisplatin as consolidation therapy. Only responding patients were given consolidation therapy. The complete remission rates were similar in both groups (64% versus 65%), but the patients who received consolidation therapy had a significantly prolonged median survival (24.4 months versus 17 months, P=.0094).

In summary, a regimen of VAC alternating with etoposide and cisplatin was associated with a slight improvement in the complete remission rate and median survival, but the differences were generally small and of minimal clinical significance.

With current therapies, most patients with small-cell lung cancer continue to die of recurrent drug-resistant disease. Active basic and clinical research is underway to evaluate the mechanisms and means of reversing drug resistance in these patients. Because the chance of cure using any standard treatment method is extremely small, all eligible patients with this disease should continue to be enrolled in appropriately designed clinical trials.

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The Hidden Costs of Malpractice

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MALPRACTICE concerns impinge significantly on the rising costs of health care in both a direct and an indirect manner. Direct costs consist of insurance premiums and of legal costs and settlements related to malpractice. The indirect costs are probably considerably higher than the direct costs but, lacking agreement on their definition, the indirect costs are difficult to quantitate. Even so, their presence is like a shadow bigger than real that casts a pall over the practice of medicine out of proportion to its true merit.

The direct costs in 1988 consisted of $5.5 billion in premiums for physicians' malpractice insurance, according to the congressional testimony of former HEW Secretary Califano;[1] and, $4.1 billion in legal costs and malpractice awards reported by Tolchin.[2] This total of $9.6 billion of direct costs is for physicians only and does not include the probably comparable costs for hospitals. Although it represents less than 2% of the total health care costs ($550 billion) for 1988, it is greatly augmented by the magnitude of indirect costs spawned by the ever-present undercurrent of malpractice fears.

Indirect or hidden costs, while clearly acknowledged, have been neither easy to identify nor to find agreement upon. Amounts discussed have ranged from less than 10% of total health care costs as derived in this review to 25%, a figure cited by Califano[1] who includes the term "waste," which may spring from his past governmental experiences. Reynolds et al in a quantitative analysis of the cost of professional liability arrived at a range of $12.1 billion to $13.7 billion as the hidden costs of defensive medicine.[3] Harris editorializing on this analysis emphasized the figure of $3.50 of defensive medical costs induced by each dollar of malpractice insurance premium.[4] Using this as a basis for our formula the hidden costs of malpractice amount to nearly $20 billion for 1988. This figure is consistent with the figure of $20 billion cited by Califano[5] and comparable, considering inflationary factors, with the figure of $15 billion given by the AMA Task Force on Professional Liability in 1984.[6]

What percentage of the total national health costs this represents is less important than what could be done with such a magnificent sum. For example, it could go a long way toward providing Medicaid coverage for that 62% of the group below poverty level not now eligible for Medicaid.

These hidden costs of the malpractice scene may be divided into three broad categories: 1) the cost of defensive medicine, 2) product liability costs, and 3) personal costs not covered by liability insurance premiums. Of the three, defensive medical costs are the most widely acknowledged and personal costs the least appreciated.

Defensive Medicine

Defensive medicine, some claim, is good medicine. It has its price, however. Such parts of defensive medicine as advance the management of the patient's clinical problem are certainly good, but at what point do diagnostic studies stop and good clinical judgment begin? In this ill-defined area, the hidden monetary costs of defensive medicine surface—complete with its underlying concept that a suit is more likely if a test has been omitted than if an extra test is done. An AMA study in 1985 estimated that medical professional liability costs raised the cost of services rendered by physicians about 15% and that 75% of these costs were related to defensive medical practices employed by 70% of physicians.

Defensive medical practices may be of a positive or of a negative type. The latter consists mainly of abandonment of risk situations. For example, a generalist eliminates minor surgical procedures which are referred to a specialist, whose higher fee adds significantly to the cost of medical care. Likewise, a specialist decides to diminish his risk so he refers the riskier procedures to a distant tertiary care center at great expense and inconvenience to the patient and family.

Positive defensive practices essentially represent risk management. These include more detailed and perhaps better record-keeping, which increases transcription costs, and more tests and treatment procedures directed toward limiting exposure. Defensive medicine also includes increased time and, therefore, cost per patient visit. Visits, too, increase in frequency.

Product Liability

Product liability also is an element in the soaring costs of medical care, and I have only to mention two well-known examples to prove the point. A vial of triple vaccine costs five or six times as much in the United States as it does on the export market. The second example is the inflated cost of female contraceptive devices. In both instances, the higher prices have not brought in new manufacturers but on the contrary have driven out many of the established ones who could not carry the burden of product liability. In the field of spinal surgery,

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implantable spinal instrumentation, recently exhibited at a spine conference, seemed inordinately expensive, including a $75 screw. The explanation offered was that 40% of the cost represented liability insurance premiums.

Personal Costs

Not least of the hidden costs, but until recently least discussed, are the personal costs. Being sued for malpractice can be emotionally devastating and physically stressful. Often the entire family suffers by not knowing the reason for overt behavioral changes in the involved physician. Recently both major malpractice insurance carriers in this state have established counseling services to offer help for such physicians and their families.

The problems can be divided into two categories: emotional and personal economic costs. The latter are clearer to define and can be considered first. Usually, out-of-pocket expenses are estimated at between $20,000 and $30,000 for personal legal fees, research costs, and on-going office expenses during enforced absences related to the case. Time away from one's practice will include conferences with insurance representatives, assigned defense attorneys and, if so elected, personal attorneys. Much time will be required to review adequately medical records and to review widely the literature on the subject. Being fully prepared is the key to establishing confidence, attitude, and emotional control so necessary in court. Although the attorneys conduct independently many formalities of the case, three time consuming events concern the physician. These are the oral deposition, the pretrial conference with the attorneys, and the trial itself. The deposition is in question-and-answer form under oath. This creates a transcript admissible as evidence in court and the process should be taken seriously. Any appearance of informality at the deposition is illusory.

When we consider the emotional costs, there are those related to the trial and those related to having been sued and having to suffer the seemingly interminable wait to trial, often running into years (average 48 months). A physician's emotions prevent objective assessment of the potential outcome of the trial so it behooves the physician to heed trustingly the advice of the attorneys. They remain by training more detached and, therefore, better able to assess the tangible as well as the intangible aspects of the case, especially the fickle conduct of juries, which they understand so much better from long experience in dealing with them.

Until recently the emotional cost has been suffered in silence. Its discussion in the literature and the establishment of support groups have helped open the curtain of personal secrecy that characterized the average physician's reaction to having been sued. Upon being served with a summons, the initial reaction is one of benumbed disbelief followed by self-deprecating analysis, schooled as the physician is in the pursuit of excellence, then feelings of inadequacy, and, finally, anger, frustration, and a tremendous sense of isolation. More specifically, a recent study by Charles et al have provided the following statistics; 97% of physicians acknowledged emotional or physical reactions to having been sued; 86% felt inner tension; 80%, depressed mood; 80%, frustration; and anger, 70%. Symptom clusters were described, the commonest of which was the anger cluster, characterized by anger accompanied by at least four of the following symptoms: depressed mood, inner tension, frustration, irritability, insomnia, fatigue, headache, or gastrointestinal symptoms. The cluster symptoms occurred not only in those (67%) who lost at trial but also in those (48%) who won.[7,8]

Physical events included gain or loss of weight, gastrointestinal illnesses, and coronary occlusion; even suicide has been described. Related to stress as these conditions are, it seems reasonable to accept them as malpractice costs. Support from social and peer contact in recent reports by Charles[9,10] was increasingly utilized compared to her earlier reports in which only 10% of respondents acknowledged talking over their problems with one of their peers. Consequently, support groups for those physicians facing a malpractice suit may be as important to them as risk-management seminars are to physicians in general. However, in talking to one's peers, talk should cover emotions and not the case, lest the revelations prove educational to a potential expert witness for the plaintiff. It is gratifying that in Connecticut our carriers are supportive of this concept. Such support groups should be most effective in counteracting the denial process, a common protective mechanism of physicians, which drives internally all the emotional stresses with the many unpleasant consequences enumerated above.

Those consequences also include early retirement, changes in practice patterns, altered attitudes towards patients, and, sadly, reduction in the joy of medical practice. So long as malpractice remains influenced by societal forces that show little trend toward an era of *philadelphia,* physicians must view the problem as they would a chronic skin disease, seldom fatal but always nettlesome, never sure where the next eruption will appear, and for which one foregoes the hope of cure and seeks, at most, a means to cope. In this milieu, the first step is for the involved physician to seek a friendly, sympathetic, and compassionate ear and for the rest of us to serve willingly if asked.

Some subtler hidden costs need to be mentioned. One is the risk of decreasing availability and access to medical care. Obstetrics represents a well-studied example. Another is the deterioration of the trusting relationship between doctor and patient. Without question there is something personal and emotional in a lawsuit between a patient and a doctor, something not seen in suits against large and faceless corporations. Loss of esteem, both self and community, are more intangible but quite real ever since Hippocrates first discussed this problem in the opening of his book entitled *Law.* Lastly there is the distinction between maloccurrence and malpractice which may be understood by doctors and lawyers but which may elude jurors who decide on cases and their awards.

The Future

Currently, fewer malpractice suits are being filed[11] because of at least three causes: 1) tort reform which has practically eliminated frivolous claims; 2) the hardened attitude of insurers against settlements short of a trial; and, 3) the economic realities of the inflated advance costs for pursuing minor nuisance cases, which are now experiencing a dearth of professional sponsorship. While this may be encouraging, there is no solution in sight for either reducing the hidden costs of malpractice or the size of major malpractice claims. Most telling is a recent quotation in *Medical Economics*[12] on the cost of our tort system as a percentage of gross national product (GNP) which indicated the cost for 1987 at 117 billion dollars or 2.6% of the GNP, more than three times higher than our next highest rival, Switzerland, and 10 times higher than the lowest contender, Australia. The problem, it would appear, is as much societal as it is medical, for it seems that as medicine gets better and malpractice awards get bigger there is a societal inflation that is content with neither. Until society, which includes the courts, looks objectively at expectations in the field of health, the American civil justice system for the physician on trial will remain, as some have described, neither civil nor just.

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HELPFUL HINTS

Meet the Patient

E. TREMAIN BRADLEY, M.D.

"Come in," I say, "How do you do?"

There is a pause while the patient tries to think of an appropriate response.

"Or is that the question you came for me to answer?"

She is relieved and senses that I am ready to listen.

"Please sit down, right over here."

The chair is beside my desk, or on the opposite side from me. But where do I sit? I should have my back to the window to minimize shadow on my papers, and maybe to avoid distraction and gazing into space. All of this sounds silly, but it's not.

With my patient opposite me, well lighted by the window, I can watch her facial expressions and reactions. But what does she face? The bright window behind my head. No chance to read my expressions, my reactions, my feelings. To her it's like a police interrogation, causing her to close up, be protective. I find my patients are much more relaxed and free to talk if they can see my face clearly, without a light behind my head. It is in this situation, then, that the chief complaint and basic history are obtained; embellishments can come later.

After being prepared for examination, the patient is seated *up* on the end of the examining table. I take my seat on the low mobile stool *down below.* This can give the patient a sense of authority or confidence or even superiority; at least, I am no longer in the role of a policeman or domineering parent. Now the real story can, and usually does, come out — in detail and often with emotion. My job is to absorb, understand, to avoid being critical which might turn off her willingness to talk. A nonthreatening question or a simple request for expansion of an earlier remark may help her to talk freely about her real concerns. This phase of the visit may come before, during, or after the examination — piecemeal or all at once.

Yes, the medical complaint must be addressed and opinion offered in due course, but meanwhile there has been an appraisal and an understanding of the *whole* patient. And the basis has been formed for a good doctor-patient relationship, to the benefit of both of us.

E. TREMAIN BRADLEY, M.D., solo practice of General Surgery, retired to Norfolk, CT.

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Action: Yohimbine blocks presynaptic alpha-2 adrenergic receptors. Its action on peripheral blood vessels resembles that of reserpine, though it is weaker and of short duration. Yohimbine's peripheral autonomic nervous system effect is to increase parasympathetic (cholinergic) and decrease sympathetic (adrenergic) activity. It is to be noted that in male sexual performance, erection is linked to cholinergic activity and to alpha-2 adrenergic blockade which may theoretically result in increased penile inflow, decreased penile outflow or both.

Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalmic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it; however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

Indications: Yocon® is indicated as a sympathicolytic and mydriatric. It may have activity as an aphrodisiac.

Contraindications: Renal diseases, and patient's sensitive to the drug. In view of the limited and inadequate information at hand, no precise tabulation can be offered of additional contraindications.

Warning: Generally, this drug is not proposed for use in females and certainly must not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

Adverse Reactions: Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug.[1,2] Also dizziness, headache, skin flushing reported when used orally.[1,3]

Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.[1,3,4] 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to ½ tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.[3]

How Supplied: Oral tablets of Yocon® 1/12 gr. 5.4 mg in bottles of 100's NDC 53159-001-01 and 1000's NDC 53159-001-10.

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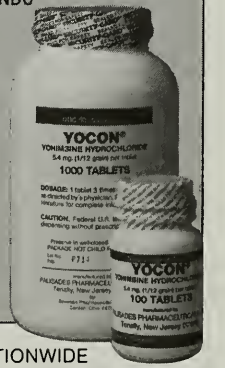

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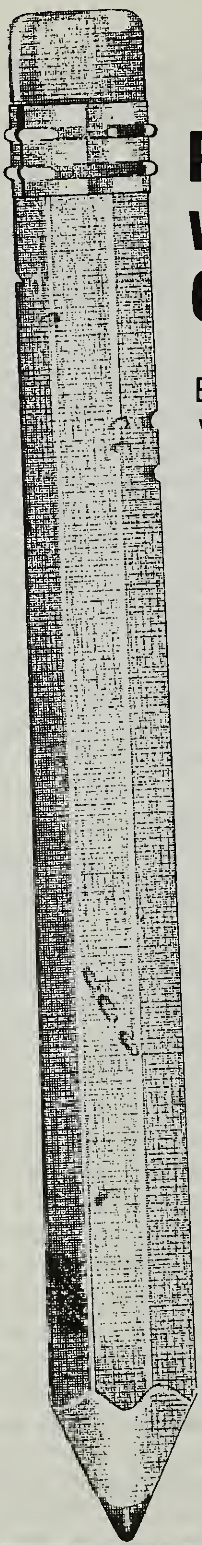

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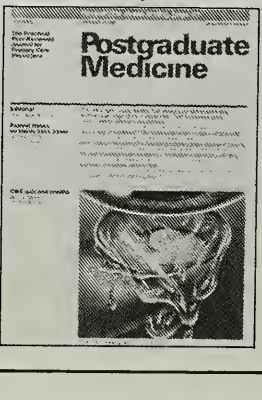

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Heparin-Induced Thrombocytopenia and Thrombosis

TERESA J. LUBOWSKI, PHARM.D.

HEPARIN is a complex polysaccaride which exerts its effect by potentiating the naturally occurring inhibitor antithrombin III. Heparin is an integral part of the treatment of thrombotic diseases, prophylaxis of deep vein thrombosis and pulmonary embolism and anticoagulation in extracorporal procedures such as cardiac surgery. Common adverse effects related to the use of heparin include bleeding, allergic reactions, and osteoporosis. A less common complication of heparin therapy is heparin-induced thrombocytopenia and thrombosis.

Frequency of Heparin Induced Thrombocytopenia and Thrombosis

The true incidence of heparin-induced thrombocytopenia is subject to debate with estimates ranging from negligible to 30%.[1,2] Since 1980, the published literature suggests a frequency of 5-10%. Differences in the incidence of heparin-induced thrombocytopenia may be the result of study variables such as the definition of thrombocytopenia, duration of heparin therapy, type of heparin used, lot number of the preparation used and underlying disease. For these reasons it is difficult to compare studies on the incidence of this reaction. Although the reason is unknown, bovine heparin has shown a higher incidence of heparin-induced thrombocytopenia then porcine heparin.[1] Other studies have failed to show this difference.[3,4] The possibility of a higher level of antigenicity with the bovine preparation has been proposed as a mechanism. Unlike thrombocytopenia, the actual risk of heparin-induced thrombosis has proved to be very low (0-0.5%).[5]

Clinical Features

There are two types of heparin induced thrombocytopenia. The mild form is most likely caused by the ability of heparin to increase the platelet response to aggregating stimuli, and it has a rapid onset. This type of thrombocytopenia occurs within the first few days of exposure to heparin and usually improves during continued heparin therapy with few complications. It has been reported to occur in as many as 15% of patients exposed to heparin.[6] The second type of heparin-induced thrombocytopenia is more serious and is associated with life and limb threatening complications. This syndrome appears unrelated to the route of administration or dose of heparin. It is characterized by a marked thrombocytopenia (platelets less than 100,000) and is often associated with thromboembolism and/or hemorrhage. Pathologic examination has shown that the thrombi produced by this syndrome are made of platelets and are called white clots.

Chang et al reviewed 23 cases of white-clot syndrome associated with heparin thrombocytopenia.[7] The thrombocytopenia was usually detected within 10 days (one to 16 days) after initiation of heparin. If a patient had been exposed and sensitized to heparin previously, thrombocytopenia occurred more rapidly, even within three days. This syndrome was observed in patients receiving both low-dose and high-dose heparin. The clinical spectrum of white-clot syndrome included arterial thrombosis, cerebral thrombosis, and venous and pulmonary thrombosis. Fourteen patients recovered and survived after the diagnosis of the syndrome. Nine patients (40%) died of the white clot syndrome. Among the survivors, three needed amputation of one or more extremities and one had a permanent neurologic deficit following cerebral thrombosis.

Pathogenesis and Diagnosis

The severe form of thrombocytopenia seems to be induced by antibodies. Several investigators have described a heparin-dependent IgG platelet aggregating antibody. It is likely that the consumption of platelets resulting from in vivo aggregation is responsible for thrombocytopenia.

A method of determining whether a patient has heparin-induced thrombocytopenia is the platelet aggregation test. This test is performed by mixing normal multiple donor platelets with patient's or control plasma

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This series on Drug Information Updates from Hartford Hospital are provided by the Drug Information Center, Department of Pharmacy Services, Hartford Hospital.

Editors: Moses Sing Sum Chow, Pharm.D., and Robert A. Quercia, M.S., R.Ph.

in the presence of heparin. A platelet aggregometer is then used to test for the presence of the antibody. If the optical density is below 70% of the baseline and control values, the test is interpreted as giving a positive result and the test is repeated with the addition of protamine before heparin. If the patient's plasma shows no aggregation when protamine is added the plasma is considered to contain a heparin-dependent platelet aggregating factor. Reported false negative results may be caused by an inadequate normal donors platelet pool, since the platelets of 50% of normal people lack the ability to detect the heparin-dependent factor.

Treatment

Platelet counts should be obtained prior to initiating heparin therapy and every three to four days during therapy. If the platelet count decreases to less than 100,000, a platelet aggregation test should be performed. If this test is positive, heparin should be discontinued as soon as possible. If continued anticoagulation is needed, warfarin therapy should be started. Some authors suggest that heparin-induced thrombocytopenia can be prevented by simultaneous administration of warfarin. In this way, heparin can be discontinued within three to four days. Severe thrombocytopenia usually occurs seven to 10 days after therapy. If a daily platelet count declines but remains above 100,000 some suggest switching the type of heparin (bovine to porcine) followed by daily platelet counts. Whether this is of benefit has not been established.

When platelet counts decrease to less than 20,000, or if thrombosis develops, heparin should be discontinued promptly. Warfarin and intravenous dextran have been proposed as therapeutic alternatives. Specific therapy for arterial thrombosis, such as thrombolytic therapy or surgery, may also be indicated.

Certain patients with heparin-induced thrombocytopenia and thrombosis may require reexposure to heparin for emergency cardiac surgery while still demonstrating positive invitro platelet aggregation with heparin. There are multiple treatment suggestions such as aspirin with dipyridamole or a prostacyclin analog (Iloprost) available on an investigational basis. Aspirin prevents platelet aggregation by inhibiting cyclo-oxygenase and thromboxane production. Dipyridamole is a vasodilator drug with modest platelet inhibitory properties. Makhoul et al reported on the use of aspirin and dipyridamole given prior to heparin therapy and continued through the postoperative period.[8] Despite the presence of heparin-dependent platelet aggregating factors in the plasma, both patients had an uneventful reexposure to heparin. The use of Iloprost before heparin has recently been used in patients with heparin-induced thrombocytopenia who require cardiac surgery.[9] Iloprost produces an antiplatelet effect by inhibiting platelet adhesion and aggregation. Iloprost acts immediately with infusion and has an elimination half life of 15 to 30 minutes. Caution should be exercised in using Iloprost because it may cause vasoldilation and hypotension. The dose of Iloprost is titrated according to the Berlex Lab investigational protocol.[9]

The use of intravenous immunoglobin has recently been introduced as a treatment for heparin-induced thrombocytopenia. Frame and coworkers reported a case of heparin-induced thrombocytopenia and intestinal bleeding successfully treated with immunoglobulin 0.4 g/kg of body weight followed by platelet transfusion.[10] Immunoglobulin may interfere with the binding of immune complexes to platelet receptors in this disorder. This is supported by only a single case report but may be an important area for future research.

Summary

Heparin-induced thrombocytopenia and thrombosis can occur with both low-dose and high-dose heparin. Clinicians should be aware of this syndrome, and platelet counts should be monitored prior to initiating heparin and during the course of therapy. The treatment of heparin-induced thrombocytopenia is variable depending on the use of heparin in each individual patient. Treatment options include discontinuation of heparin, initiation of warfarin in place of heparin, and possibly switching from bovine to porcine heparin in milder cases. Intravenous immunoglobin is the most recent treatment option reported for heparin-induced thrombocytopenia and thrombosis. The patient with heparin-induced thrombocytopenia and thrombosis requiring emergency cardiac surgery and reexposure to heparin is more difficult to manage. Aspirin given with dipyridamole or Iloprost have both been reported to be successful in managing this group of patients. Heparin is a commonly used drug in all areas of medicine. The early recognition and treatment of heparin-induced thrombocytopenia and thrombosis has resulted in a reduction in the morbidity associated with this syndrome.

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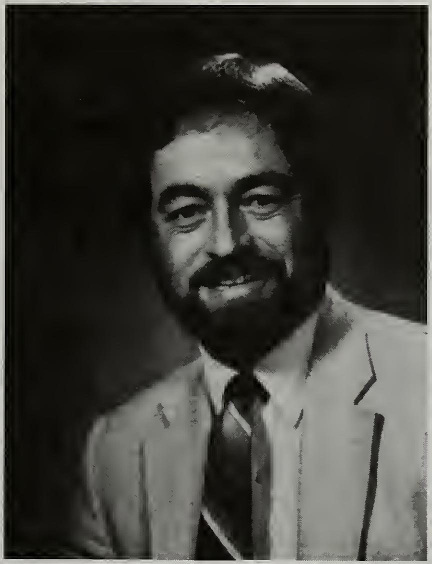

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HIV Testing of Transfusion Recipients

CONNECTICUT STATE MEDICAL SOCIETY COMMITTEE ON ORGAN AND TISSUE TRANSFERS

IN April 1989 the American Hospital Association, in response to a recommendation made by the Presidential Commission on the Human Immunodeficiency Virus (HIV) Epidemic, endorsed the idea of educating prior transfusion recipients about the risk of transfusion-transmitted HIV infection. They did not specify how this was to be done or by whom, but their action has placed physicians in the position of evaluating the Presidential Commission's recommendation and planning what action, if any, is appropriate for them and their patients.

This issue is complex. Because the benefits of HIV testing are becoming clearer and because any action has the potential for increasing the anxiety of patients about HIV infection, the Committee on Organ and Tissue Transfers of the Connecticut State Medical Society has prepared this statement for your guidance.

The risk of acquisition of HIV from a blood transfusion depends on the date of transfusion, the number and type of blood components transfused, and the demographics of the blood donor population. AIDS has been detected in the United States as early as 1977. The seroprevalence in the general and blood donor populations was not known before 1985. By spring 1985 the availability of HIV antibody testing made it possible to eliminate almost all infected blood donors from the blood supply. By 22 April 1985 all blood components distributed by the Red Cross in Connecticut had been tested and found negative for the antibody to HIV virus. It was then possible to measure the seroprevalence of HIV in blood donors at that time. In Connecticut this was 3.4 in 10,000 blood donations in the spring of 1985. Transmission of HIV by seropositive blood is very efficient. Therefore, the risk of acquiring HIV by transfusion in the early spring of 1985 can be estimated as two to three cases per 10,000 blood products. Since the risk of multiple transfusions is additive, the risk of acquiring HIV infection in early 1985 from transfusions of 10 units of red blood cells, or 10 units of platelets or other blood component, was about one in 300-500.

The risk in the years before early 1985 is not known. However, it is likely the rate was rapidly increasing from very low risk in the late 1970s to a higher level in 1984-85. The first documented case of posttransfusion AIDS in Connecticut occurred from transfusions in 1980.

HIV seroprevalence in blood donors has decreased since 1985 because of elimination of HIV antibody-positive donors and the establishment of improved methods of donor education and self-deferral. These methods have been shown to be highly effective. In fact, the seroprevalence in the blood donor population is estimated to be about 2% of that in the population as a whole. Currently in Connecticut the seroprevalence is about one in 10,000 blood donations. Even though blood donations that test positive are discarded, there continues to be some risk from tested blood, estimated to be about one in 100,000 blood products. This is primarily due to donations occurring shortly after the donor's exposure to HIV and before seroconversion, i.e., during the "window period."

The risk of transfusion-transmitted AIDS, therefore, is significant in patients who were transfused in the time period 1981 - April 1985, particularly for patients who received multiple blood transfusions. The risk was substantially reduced after 22 April 1985, and now may approximate one in 100,000 units transfused.

Some recipients of HIV-infected blood components have been identified, by Lookback, a program that identifies patients who received components from blood donors who later, after testing was initiated, tested positive for HIV. The Lookback program offers these patients, through their physician, counseling and HIV testing. This program has been effective in identifying blood recipients infected with HIV. About half of the recipients of blood components identified through the Lookback program have been HIV positive when tested. An unknown number of recipients of infected components, however, remain undetected, either because the donor of the infected blood never returned to donate blood after HIV testing was initiated or because the Lookback program was not completed.

Testing blood component recipients at significant risk of HIV would allow identification of these infected patients. Some of these HIV infected patients may benefit from prophylactic AZT or from aerosolized pentamidine. In addition, identification of HIV infection can allow counseling by the physician to avoid spreading HIV to others, thus assisting in the control of the AIDS epidemic.

The Connecticut State Medical Society Committee on Organ and Tissue Transfers has considered the above information and makes the following recommendations:

Recommendations

1. A transfusion history should be part of every patient evaluation in order to identify those who may be at greater risk of transfusion-transmitted HIV infection.
2. Patients who are transfusion recipients should be evaluated and, if appropriate, offered HIV testing and counseling. The importance of this evaluation is greater in some patients. For example, some recipients are at greater risk of infection with HIV following transfusion. These include those who were transfused during the period immediately before HIV testing was implemented and those transfused with a large number of blood components. Other patients may be at greater risk of the consequences of unidentified transfusion-transmitted HIV infection, such as women in the childbearing period and recipients transfused as infants or children.
3. Physicians should cooperate fully with the Red Cross/Hospital Lookback program. Counseling and testing of recipients of blood components identified by Lookback is almost always indicated.
4. Physicians should bring this recommendation to the attention of their hospital's medical staff for further discussion or action. Physicians should support institutional programs aimed at identifying, counseling, and HIV testing of appropriate transfusion recipients.

Michael Kashgarian, M.D., Chairman, Jonathan B. Borak, Edward S. Breakell, M.D., Ritchard Cable, M.D., Edwin M. Clayton, M.D., Ramon N. Kranwinkel, M.D., David J. Krugman, M.D., Edward E. Morse, M.D., Irwin Nash, M.D., Dwight M. Rost, M.D., Robert T. Schweizer, M.D., Edward L. Snyder, M.D., Hollis N. Truax, M.D.

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50 Years Ago

From the *Journal of the Connecticut State Medical Society*

April 1940

It Can Happen Here

Anyone who wants to know the hocus pocus and cumbersome bureaucracy of sickness insurance should take the time to read Bill Number 2050 introduced into the Assembly of the State of New York by Mr. Robert F. Wagner, Jr. on February 28th. An entire evening had better be set aside for its perusal for the Bill is 54 pages long and replete with details. Mr. Wagner still relies upon the deceptive magic of the term "health" insurance and the title of the Bill is "To Provide For the Establishment and Administration of a System of Health Insurance."

Under the Bill participation will be compulsory for all persons with an annual income not exceeding $1500 or a weekly wage of not more than $35.00, except all agricultural labor and domestic servants when less than three are employed. Minors in part-time employment and attending school are also excepted. Whether these exceptions are made because it is expected that these people will not be sick or whether they are not exposed to the collection of taxes is not made clear.

Voluntary coverage under certain restrictions including a health examination is provided for any resident of the State whose net income from any source is $30.00 a week or less, who has not reached his 65th birthday, and any resident of the State whose net income from whatever source does not exceed $50.00 a week.

The system will give insured persons and their dependents ordinary medical care wherever rendered by a general practitioner for a period of 26 weeks, including immunization and periodic physical examinations; the services of a specialist consultant when prescribed by the general practitioner; hospitalization when prescribed; dental care; and, subject to limitations of the administering board, drugs, medicines, surgical and dental appliances, and institutional care for convalescents. Weekly cash

(Continued on page 226)

The Future of General Surgery

AMA COUNCIL ON LONG RANGE PLANNING AND DEVELOPMENT

During the past several years, the American Medical Association's Council on Long Range Planning and Development has identified trends in the environment of medicine that are likely to affect physicians, their practices, and the provision of medical care in the future. In the course of its environmental analysis studies, the Council has recognized that each medical specialty is uniquely subject to anticipated changes in the environment of medicine. As part of an ongoing series of analyses prepared by the Council, this report focuses on environmental trends that are likely to influence the practice of general surgery. The report outlines the current state of general surgery, the forces for change in the environment, and the implications regarding these changes. The Council concludes that there are certain challenges and many positive indicators for the future of general surgery.

IN 1986, over 25 million operations occurred in short-stay hospitals, another 8.7 million operations occurred in hospital outpatient settings, and countless minor operations were performed in surgeons' offices.[1] Although there are several surgical specialties in the United States, this report focuses on trends in the environment of general surgery. The first section of this report outlines the current practice environment of general surgery. The second section presents projections of the future need for and supply of general surgeons and focuses on several factors in the environment of medicine that may affect those projections. The last section outlines possible activities to improve health care for the public and to assist general surgeons in preparing for the future.

Current Environment

Surgery has been described as "one of the oldest forms of medical treatment for which direct medical evidence exists."[2] In recent times, general surgery has been defined "as that operative discipline in which surgeons take care of and supervise the care of patients with multiple systems injuries, diseases of the gastrointestinal tract and endocrine glands, and hernias."[3] More specifically, general surgeons treat problems related to obstruction or perforation of hollow viscera, manage hemorrhage from discrete points of bleeding, remove tumors, repair congenital and other structural abnormalities, drain abscesses, obtain tissue for pathological examination, and provide comprehensive management of trauma. To provide a context for the issues affecting general surgeons and their role in the provision of health care, this section will review the demographic trends and socioeconomic indicators of general surgery.

Demographic Characteristics of General Surgeons

In the 1986, there were approximately 519,400 active physicians in the United States, of whom 129,200 were surgical specialists of all types (data from the American Medical Association [AMA] Masterfile, 1988). The largest surgical specialty in 1986 was general surgery, with approximately 32,100 physicians designating themselves as general surgeons; about 23,200 general surgeons had completed their residency training programs, while 8900 were in a residency program in 1986 (data from the AMA Masterfile, 1988).

The demographic characteristics of general surgeons are different from those other physicians in several respects. One difference is the large percentage of general surgeons in residency programs. In 1986, about 28% of the self-designated general surgeons were either residents or clinical fellows. In comparison, approximately 18% of all active physicians were in residency training (data from the AMA Masterfile, 1988). This difference largely results from the fact that general surgery training is a prerequisite for admission to other surgical programs. Consequently, the percentage of general surgeons who are residents is higher than average because of the large

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Members of the Council on Long Range Planning and Development include the following: Palma E. Formica, MD, Chairman; Robert S. Stone, MD, Vice Chairman; Kim A. Bateman, MD; Alfred J. Clementi, MD; Neale P. Freeman; Jonathan E. Rhoads, Jr, MD; C. Burns Roehrig, MD; Alex Scott, MD; John K. Scott, MD; Samuel P. Solish, MD; (Frank B. Walker II, MD, Richard F. Labasky, MD, and Alan C. Hartford served on the Council during the preparation of this report); Thomas M. Gorey, JD, Council Secretary; and James E. Swartwout, MA, AMA Department of Long Range Policy Analysis, Consulting Author.

From the Council on Long Range Planning and Development, American Medical Association, Chicago, Ill.

Table 1
Physicians in the United States by Age, 1986*

Age, y	% of General Surgeons	% of All Physicians
<35	32.6	25.0
35-44	21.5	28.5
45-54	18.5	18.0
55-64	17.0	14.1
>64	10.4	14.3

*From the AMA Physician Masterfile, 1986.

number of surgical residents who will eventually specialize in other areas of surgery. Some surgical specialty programs require the completion of only 1 or 2 years of general surgery training, while other surgical specialty programs require the completion of a full general surgery training program. Based on current trends, less than half of the general surgery residents are expected to become general surgeons; most will complete their graduate training in other areas of surgery.[4]

Age distribution is a second difference between general surgeons and other physicians. In 1986, a slightly higher percentage of general surgeons were under 35 years of age as compared with all physicians. Also, the number of general surgeons declines in each succeeding age group (Table 1). Tangentially, in 1986, the average retirement age of board-certified general surgeons fell below the age of 65 years for the first time in over 20 years.[4]

A third demographic difference between general surgeons and other physicians is in the gender composition of the groups. As recently as 1980, less than 4% of general surgeons were women, while about 12% of all physicians in that year were women. Between 1980 and 1986, however, the number of women in general surgery increased by 74%, while the number of women in medicine overall increased by 60%. By 1986, approximately 6% of general surgeons were women and 15% of all physicians were women (data from the AMA Masterfile, 1988). Thus, while there still is a far smaller proportion of women physicians in general surgery than in the physician population overall, it appears that general surgery is becoming an increasingly popular career choice for women physicians.

These two trends, a larger proportion of younger general surgeons than the physician population overall and the growing number of women in the specialty, may have implications that could ultimately affect manpower considerations. Women physicians tend to spend less time in practice and to see fewer patients than their male counterparts.[5] In addition, survey results indicate that young physicians, both men and women, are deciding to devote less time to their practices than are their older colleagues. It is likely that those in the specialty of general surgery share this characteristic (AMA Ad Hoc Committee on Young Physicians, Surveys of Young Physicians Report, October 1985).

Knowledge and Skills

The general surgeon is trained in the comprehensive management of surgical critical care; surgical oncology and trauma, including musculoskeletal, head, and hand injuries; and a variety of rigid and flexible endoscopic techniques. Training in general surgery also includes experience with critically ill patients and experience in the care of the typical problems in cardiac, thoracic, gynecologic, neurological, orthopedic, plastic, pediatric, neonatal, and urologic surgery and in anesthesiology. Currently, general surgery residency programs are a minimum of 5 years in length. Four of the 5 years must be devoted to clinical experience, with the final year being devoted entirely to training in the principal components of general surgery (Table 2).

While performing operations is a major activity of general surgeons, they are also responsible for confirming or making preoperative diagnoses, for preoperative management and postoperative care, and for follow-up care. Therefore, it is important that resident physicians, as well as medical students on clinical rotations, are exposed to a broad range of patient care situations. However, this may become increasingly problematic, since the continuation of a current trend suggests that a significant proportion of those admitted to hospitals in the future already will have been diagnosed and a treatment plan established. This underscores the value of resident participation in outpatient services. As a required component of accredited residency programs in general surgery, service in outpatient facilities provides residents with a broad scope of experience in patient care.[6]

Currently, approximately 70% of the physicians who complete residency training today choose to become board certified (data from the AMA Masterfile, 1988). In 1989, to obtain a certificate in general surgery, three requirements must be completed: the successful completion of a general surgery residency program and passing

Table 2
Basic Areas of Study in Surgery Residencies*

Wound healing
Hemostasis and blood disorders
Oncology
Immunobiology and transplantation
Surgical microbiology
Surgical endocrinology
Metabolic response to injury
Respiratory physiology
Genitourinary physiology
Gastrointestinal physiology
Shock and circulatory physiology
Musculoskeletal biomechanics and physiology
Applied surgical anatomy and surgical pathology
Surgical nutrition
Fluid and electrolyte balance

*From the *1988-89 Directory of Graduate Medical Education Programs*. Chicago, Ill: American Medical Association; 1988.

Table 3
Selected Operative Procedures Performed by Board-Certified General Surgeons, 1985*

Procedure	% of General Surgeons Who Performed the Operation
Cholecystectomy	86.5
Resection of large bowel	85.6
Appendectomy	84.5
Hernia repair (all types)	84.2
Mastectomy	83.1
Resection of small bowel	83.0
Laparotomy (emergency)	80.7
Vagotomy	78.3
Gastrectomy	78.0
Thyroidectomy	75.9
Varicose veins, excision and ligation	65.7

*From reference 8.

two examinations—a qualifying examination and a certifying examination. The qualifying examination tests the candidate's cognitive knowledge of the field of surgery. The certifying examination is designed to evaluate the surgical judgment of the candidate. Scheduled for 1990, a new examination will be added that will be taken during residency training. This examination will cover material in the basic surgical sciences and must be passed before the qualifying examination is attempted. Currently, a certificate in general surgery is valid for 10 years, and recertification requires the successful completion of a multiple-choice examination.

Scope of Practice and Professional Activities

Almost all general surgeons are providers of patient care. In 1986, over 96% of general surgeons spent a majority of their time in patient care activities, compared with 91% for physicians overall. The remaining 4% of all general surgeons identified that they spent a majority of their time in teaching, administration, or research.

While the scope of training for general surgery is very broad, the current range of practice for many general surgeons is usually much narrower because of the availability of other surgical specialists and because of professional liability concerns. The scope of practice of a general surgeon is determined by several factors, including additional training, past experience, the availability of other surgical specialists, and the practical effect of established referral patterns. A study by the National Center for Health Statistics indicates that slightly over half of the new patients for general surgeons were referred by other physicians.[7] Also, the care of a surgical patient is usually collaborative: general surgeons work with a variety of specialists to achieve an optimum result in the management of a given patient.

Although the scope of general surgery practice is variable, there are a number of conditions that are treated by most general surgeons (Table 3). The operative procedures most frequently performed in a general surgery practice are hernia repair (all types), cholecystectomy, closed reduction of fracture, mastectomy (all types), and appendectomy.[8] With the rapidly advancing state of medical science, some diseases that used to be treated by general surgeons are increasingly being treated by medical specialists. However, advances in the nonsurgical treatment of diseases are, in many respects, placing greater demands on the skills of general surgeons. Sometimes medical interventions, such as the use of x-ray-guided catheters and needles, lead to thrombosis of vessels, bleeding, or perforation of a viscus that requires emergency surgical intervention. In other cases, the surgeon is called on to operate on a patient after failure of a less invasive intervention. In these cases the disease process is likely to be more advanced and the patient sicker. The organ in question may be altered by the previous therapeutic attempt, making the operation technically more difficult and reducing the probability of a favorable outcome. Thus, the demands on the skills of the practicing surgeon, in certain respects, are increasing.

Practice Characteristics

In comparison with physicians overall, general surgeons tend to work slightly more hours per week, spend more time in the hospital per week, devote more time in surgery per week, but spend less time in the office per week. In 1987, general surgeons spent an average of about 60 hours per week in professional activities, which included approximately 12 hours per week on hospital rounds, almost 18 hours per week in surgery (including assists), and slightly less than 17 hours per week in the office (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987). In comparison, physicians overall averaged slightly over 58 hours per week in professional activities, which included almost 9 hours on hospital rounds, about 6 hours in surgery, and 27 hours in the office (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987).

Corresponding with the hours spent in each practice location, general surgeons see fewer patients in the office and more patients in the hospital than do other physicians. In 1987, the average number of office visits per week was 44.8 visits for general surgeons, 81.9 visits for other surgical specialists, and 77 visits for all physicians (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987). In contrast, the average number of hospital visits per week in 1987 was 42.7 visits for general surgeons, 23.4 visits for other surgical specialists, and 25.1 visits for all physicians (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987).

Over the past several years, total patient contacts (office visits, hospital visits, nursing home visits, etc) per week for general surgeons have been falling. The average number of patient visits per week declined from 105.5 visits in 1983 to 94.3 visits in 1987 (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987). The decline occurred primarily in hospital visits, which fell from 53.1 visits in 1983 to 42.7 visits in 1987 (data from the AMA's Socioeconomic Monitoring System Core Survey's, 1983 to 1987). Office visits per week declined moderately from 47.3 visits in 1983 to 44.8 visits in 1987 (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987).

The decrease in hospital visits is more likely a reflection of the shift to greater utilization of outpatient services than a decline in the demand for the services of general surgeons. Perhaps a more appropriate measure of the demand for the services of general surgeons is their surgical caseload. Between 1983 and 1987, both the number of surgical procedures per week and the number of hours in surgery for general surgeons have risen slightly (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987).

Economics of the Practice of General Surgery

Practice expenses in general surgery have risen from an average of $80,800 in 1983 to $109,700 in 1986, an increase of 36% (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987). In comparison, the average professional expenses for all physicians increased from $85,400 in 1983 to $118,400 in 1986, an increase of 39%. The AMA's data on the mean professional expenses of self-employed physicians demonstrate that for surgeons, overall, those who practiced in states in the Pacific census region had higher expenses than those who practiced in states located in the Middle Atlantic and Mountain census regions. While total practice expenses of general surgeons have been increasing at the same rate as those of other physicians, professional liability expenses have been increasing at a faster rate. In 1986, almost 19% of average practice expenses in general surgery were for professional liability insurance, while only 11% of average practice expenses for all physicians were for professional liability premiums (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987).

The incomes of general surgeons have been increasing at approximately the same rate as the incomes of other physicians. The average net income of general surgeons rose from $121,900 in 1983 to $141,200 in 1986, an increase of 16%, while the average net income of all physicians rose from $104,100 in 1983 to $119,500 in 1986, an increase of 15% (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987). Thus, although the average net income of general surgeons is higher than the average income of all physicians, the rate of increase in incomes between the two groups over the past several years has been comparable.

Forces for Change

The Council on Long Range Planning and Development has identified several environmental trends that are likely to affect the future practice of general surgery. These trends, which pose both challenges and opportunities, include the changing demographics of the US population, manpower and competition, cost-containment initiatives, professional liability considerations, and related issues in the health care environment.

Changing Characteristics of the US Population

Census studies have indicated that the growth of the US population has been slowing. After increasing by almost 19% in the 1950s, the US population increased by slightly less than 14% during the 1960s and only by 11% during the 1970s. The US Census Bureau projects that the US population will increase by about 7% in the 1990s and by less than 6% during the first decade of the next century.[9]

Despite the slowing in the growth rate of the US population, the aging of this population is likely to affect the demand for the services of general surgeons. Projections from the US Census Bureau indicate that by the year 2000, the 45- to 59-year age group is expected to increase by 45%, and the 75-year and older age group is projected to grow by 34%.[9] Older individuals tend to utilize the services of general surgeons at higher rates than younger people. Combining data on office visits with the 1980 population statistics shows that individuals over 65 years of age are approximately five times more likely to visit a general surgeon than persons under 15 years of age.[15]

Manpower

In 1975, the *Study on Surgical Services for the United States* could find no large or small areas of the United States that were significantly undersupplied with surgeons.[10] Five years later, the Graduate Medical Education National Advisory Committee (GMENAC) predicted an overall surplus of 70,000 physicians by 1990, of which 11,800 would be general surgeons.[10]

Although the GMENAC study projected a surplus of general surgeons, a 1988 study by the AMA suggests that general surgery is only one of three specialties in which the future growth in the utilization of services is likely to exceed the future growth in the supply of physicians. The study projects that the number of general surgeons will increase by just over 6%; however, the study also projects that, between 1985 and 2000, the utilization of the services of general surgeons is likely to increase by 16% to 19%.[5]

While much of the projected increase in physician contacts is the result of the expected increase in the US population between 1985 and 2000, the anticipated growth in the percentage of physician contacts is also the result of an increase in the proportion of the population over 65 years of age. Overall, the aging of the population will increase the utilization rates for the specialties most frequently used by the elderly, such as internal medicine and surgical specialties, and reduce utilization rates for specialties serving primarily younger individuals, such as pediatrics.[5]

Competition

Despite the projection that the increase in utilization will exceed the increase in supply of general surgeons, the growing number of surgeons of all types is likely to result in increased competition (Table 4). The AMA projects that the increase in the utilization of surgical subspecialists will fall short of the increase in the supply of surgical subspecialists during the next decade. Consequently, some surgical subspecialists may perform more general surgery if they find their surgical caseloads declining. Physicians who have elected to subspecialize in surgical critical care, for example, would have initially acquired the same training as general surgeons and could devote some portion of their caseload to the practice of general surgery.

Table 4
Growth Rates in the Number of General Surgeons, Surgical Subspecialties, and the US population*

	Growth Rate, %		
Years	General Surgery	Surgical Subspecialties	US Population
1970-1980	11.3	42.2	11.4
1980-1990	3.2	28.1	10.0
1990-2000	2.6	8.4	7.3
2000-2010	−0.6	2.1	5.9

*From references 5 and 9.

Technological advances have resulted in increased surgical subspecialization and a narrowing of the scope of general surgical practice. Much attention, for example, has been given recently to the use of extracorporeal shock wave lithotripsy in the management of gallstone disease. Although surgery currently remains the dominant method of treating gallstones, follow-up studies of extracorporeal shock wave lithotripsy indicate that 30% to 90% of patients are free of stones after one year.[11] This, and the development of other noninvasive therapies, will undoubtedly redefine the scope of practice of general surgeons. Additionally, general surgeons no longer routinely perform intracranial and cardiac operations, and they usually refer orthopedic patients to orthopedic surgeons. Currently, general surgeons are facing competition with plastic surgeons and otolaryngologists over the treatment of head and neck cancer and competition with orthopedic surgeons and plastic surgeons over the treatment of hand injuries. In the future, it is likely that the scope of practice of general surgeons will be further limited by advances in other areas of surgery, which may ultimately result in new surgical specialties and subspecialties.

In addition to the potential competition between general surgeons and physicians in other surgical specialties, advances in nonoperative treatments are raising the level of competition between general surgeons and medical specialists. Dilatation of stenotic arteries with balloon catheters, percutaneous needle biopsies, and endoscopic techniques may obviate the need for surgical intervention. Advances in pharmacology have also changed treatment regimens. For example, H_2-blockers have reduced the need for surgical intervention in gastric ulcers. In addition, competition is likely to grow between general surgeons and radiation oncologists over the management of certain tumors.

Mitigating the rising level of competition in the traditional practice of general surgery, technological advances are likely to provide new and greater opportunities for general surgeons. Some advances in the past have allowed general surgeons to operate on more complex or previously untreatable cases. Some of the technologies apply to the technical aspect of the operation itself, such as the introduction of choledochoscopy into biliary surgery, while other advances involve improved diagnostic methods, such as the advent of computed tomography, magnetic resonance imaging, ultrasound, and fiberoptic endoscopy. Furthermore, new technologies have the potential to increase the precision of preoperative evaluation and the determination of risk for the patient and, therefore, will impact positively on the practice of general surgery.[12]

Cost Containment

National health care expenditures rose from 5.9% of the gross national product in 1965 to 11.1% in 1987, and the dollar amount of health expenditures increased from $41.9 billion in 1965 to $500.3 billion in 1987.[13] Historically, one of the areas of rapid growth in health care expenditures has been hospital care, which includes both inpatient and outpatient services, spending for drugs and other supplies, and services associated with hospital care, including the services of hospital-salaried physicians. In 1970, about 37% of national health care expenditures were devoted to hospital care. However, by 1987 that percentage had increased to about 44%.[13] As a result of increasing health care expenditures, pressures have been mounting from both the government and private sectors to find effective methods to contain the rising cost of health care.

In an attempt to contain hospital expenditures, third-party payers (insurers) have implemented a number of utilization controls, including preadmission certification provisions, second surgical opinion programs, and claim audits. One purpose of the utilization controls is to eliminate what third-party payers consider unnecessary operations. Another purpose is to shift some operations from more costly inpatient hospital settings to less costly ambulatory settings. In fact, the number of operations in short-stay hospitals has been generally declining since 1983, but the number of operations in hospital-sponsored ambulatory settings has been increasingly steadily (Figure). As cost-containment pressures continue to mount, general surgeons are likely to see their surgical venues continue to shift toward less costly outpatient settings.

The federal government has been investigating alternatives to its current "customary, prevailing, and reasonable" method of reimbursing physicians under Medicare, including a capitation system or a relative value scale system. In September 1988, Harvard University released the results of its Resource-Based Relative Value Scale study. The results suggest that the relative value scale system would raise the fees for patient office visits and reduce the fees for some surgical procedures. A simulation of the effects of a Resource-Based Relative Value Scale system assuming budget neutrality suggests that the Medicare revenues to general surgeons could decline by 10% to 20%.[14] These projected effects, however, are highly speculative since the relative value scale system has not been perfected, no monetary conversion factor has been agreed on, and the model does not take into account the projected greater demand for the services of general surgeons in the future as a result of the aging of the population. However, a decrease in the amount of third-party reimbursement for any specialty may have negative consequences on the future manpower for that specialty.

Professional Liability

Confounding the attempts to contain health care costs has been the rising cost of professional liability insurance. The professional liability crisis may affect access to surgical care in some states by prompting some general surgeons to retire early, to change practice locations, or to eliminate high-risk procedures from their practice.

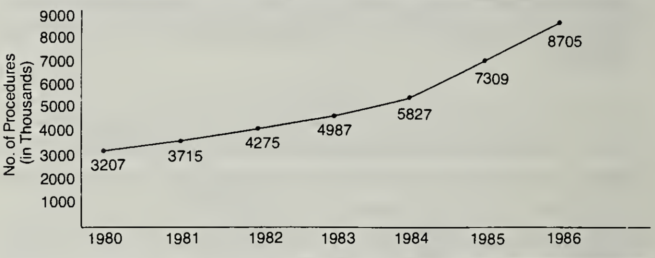
Average professional liability insurance premiums for general surgeons have risen from $9900 in 1983 to $21,000 in 1986, an increase of 112%, while averaging professional liability expenses for all physicians increased from $6900 in 1983 to $12,800 in 1986, an increase of 86% (data from the AMA's Socioeconomic Monitoring System Core Surveys, 1983 to 1987). Professional liability insurance premiums vary for general surgeons by location. According to a General Accounting Office study, annual premiums paid by general surgeons ranged from a low of nearly $6000 in South Carolina to a high of over $30,000 in Florida.[15] General surgeons in states with high rates of litigation pay higher professional liability premiums. Left unchecked, the professional liability situation could have a considerably negative impact on the practice of general surgery in some locations.

As of 1986, over half of all surgeons in the United States had been sued at least once during their career, as compared with 37% for the physician population overall. In general, there was a leveling off in the claims rate in 1986 and 1987 in contrast to the increases observed in the early and mid-1980s. However, it is unclear if this trend will continue.[16] The professional liability crisis may have a negative impact on the future supply of general surgeons, if younger physicians choose to avoid the practices of general surgery becauses of the liability stituation.

Other Issues

There are a number of other issues that are shaping the environment of medicine and will, therefore, affect all physicians, including those in the specialty of general surgery. Two such issues concern graduate medical education (GME).

The movement, both within the GME community and in the legislative arena, to address resident work hours and supervision will have significant implications for this specialty. Data collected by the AMA identify that all surgical residents work an average of 87 hours per week, with 10% working in excess of 120 hours per week.[17] As demonstrated in Table 5, these figures exceed all other specialties, with the exception of obstetrics and gynecology. However, first-year surgical residents work an average of 98 hours per week, as compared with their first-year colleagues in obstetrics and gynecology who work approximately 94 hours per week.



Trends in hospital-sponsored ambulatory surgery (from reference 1).

Table 5
Total Hours Worked per Week by Program Specialty*

	All Residents		First-Year Residents	
Program Specialty	Mean	90th Percentile	Mean	90th Percentile
Surgery	87.0	122.0	98.0	125.0
Family practice	70.5	101.0	82.3	110.0
Internal medicine	74.6	107.0	90.3	116.9
Pediatrics	79.2	107.2	93.6	120.0
Obstetrics/gynecology	89.1	117.3	93.9	120.2
Radiology	50.1	71.0	51.0	71.2
Psychiatry	52.6	74.7	66.5	96.0
Anesthesiology	76.0	102.0	81.4	121.2
Pathology	47.9	74.7	54.3	78.0

*From the 1987 Survey of Resident Physicians, American Medical Association Center for Health Policy Research, Chicago, Ill.

Concurrently, the federal government is seeking to redefine the amount of reimbursement for GME provided by Medicare. Because the cost of the Medicare program constitutes an increasing proportion of federal expenditures, there is continuing pressure to reduce both direct and indirect payments to institutions that provide residency training. As of July 1986, Medicare will provide 100% reimbursement for a hospital's direct GME costs only for the minimum number of years necessary to satisfy the requirements for initial board eligibility, plus 1 year—with a maximum of 5 years.

The issues confronting GME have several potential implications for general surgery. Currently, general surgery programs are a minimum of 5 years in duration. For those programs longer than 5 years, there will be financial incentives for them to reduce the duration of their training programs. Additionally, the advent of increased scrutiny of resident work hours and level of supervision and the almost certain implementation of regulations will affect the entire fabric of residency training in general surgery. It has been speculated that the need for hospitals to hire ancillary help to perform those tasks previously undertaken by residents will have severe financial implications, which may lead to a curtailment of the number of residency programs and positions that an institution is able to support. Also, the change in GME funding might reduce the number of fellowship positions available in subspecialty areas of general surgery. These restrictions could have an adverse impact on physicians choosing general surgery or a subspecialty of general surgery as a career.

The acquired immunodeficiency syndrome (AIDS) epidemic is presenting other serious and unresolved issues. For example, AIDS is creating an ethical dilemma for surgeons regarding the right to know whether a patient has the virus. Frequently, surgeons expose themselves to the risk of infection when blood is splattered during an operation, a needle accidentally pricks the surgeon's hand, or a sharp bone chip pierces the surgeon's glove. Some surgeons would like to have the right to test patients for the AIDS virus before operating. Many surgeons, however, argue that the use of standard prevention measures taught in residency programs eliminates the need for AIDS testing. Surgeons not in favor of testing patients for the AIDS virus prior to an operation suggest that discrimination may occur against those patients who test positive.

The future direction of general surgery may be affected by those who strenuously oppose the use of animals in biomedical research. Animal rights activists seek the passage of laws that would ban the performance of experiments or tests using animals. Scientists argue that virtually every advance in medical science in the 20th century, from antibiotics and vaccines to the development of anticoagulants and organ transplantation, has been achieved either directly or indirectly through the use of animals in biomedical research. Scientists justify the use of animals in biomedical research on two grounds: the contribution that the information makes to human health and welfare and the lack of an alternative way to obtain the information and knowledge.[18] Further advances in the use of drug therapies and invasive techniques, critical components of the training and practice of general surgeons, have the potential to be stymied if the use of animals in research is curtailed or eliminated.

Implications for the Future

In summary, the following factors are likely to influence the future socioeconomic environment of the practice of general surgery:

- The demographics of the US population will change, including, most notably, a shift toward the health care needs of an aging population. Consequently, utilization of the services of general surgeons is projected to increase by 16% to 19% beteen 1985 and 2000, while the supply of general surgeons is projected to increase by about 6% between 1986 and 2000.

- Advances in medical science may alter the practice of general surgeons, since some diseases formerly treated by general surgeons will be treated by medical specialists. Additionally, advances in medical technology may lead to further surgical subspecialization and thereby narrow the scope of practice of general surgeons. Such advances have the potential to increase competition both between general surgeons and physicians in other surgical specialties and between general surgeons and nonsurgical physicians.

- Current cost-containment efforts coupled with the shift to greater provision of health care in outpatient settings have the potential to impinge on the range of experience provided in hospital settings, and underscore the need for residents to obtain experience in a variety of situations, including outpatient and ambulatory care settings.

- Continuing professional liability problems may affect the choice of practice location and the types of procedures performed by general surgeons.

- Government and third-party payors are likely to continue to initiate cost-containment controls that will exert considerable influence on GME and practice reimbursement for general surgeons.

- Ongoing issues in the environment of medicine, such as the continued spread of the AIDS virus and the mounting opposition to the use of animals in biomedical research, will continue to confront all physicians, but will undoubtedly pose particular ethical and practice challenges for the future of general surgery.

The trends affecting general surgery indicate that the scope of practice of this specialty will be very different 20 years from now than it is today. To prepare general surgeons for the future, creative means should be sought by the medical profession to promote the advances in general surgery and to assist general surgeons in adjusting to and shaping the environment in which they practice. Among the activities that should be considered are the following:

1. Assist general surgeons in further developing and promoting their cost-effectiveness skills to third-party payers and others. Good surgical judgment is cost-effective health care. General surgeons are in a unique position to provide cost-effective consultative skills, not only to patients and other physicians but also to third-party payers.

2. Continue to address the professional liability issue. The medical profession has been addressing this pressing issue with a number of innovative proposals to reform the tort system. However, it will be essential to maintain the pressure for tort reform.

3. Promote and maintain high standards among general surgeons by ensuring that general surgery residences are trained to deal with the complex issues they will face throughout their professional careers.

4. Assist program directors in developing creative methods of structuring a surgical resident's work load to ensure a quality GME. The traditional work load of surgical residents should be scrutinized to determine what activities can be handled by ancillary personnel.

5. Establish or enhance continuing medical education courses designed to teach the latest surgical techniques to general surgeons.

6. Foster basic and clinical research in diseases treated

by general surgeons. Assist general surgeons in becoming leaders in the development of new methods of treating disease. In the past, many areas of general surgery have been usurped by other surgical specialists because new medical technologies have obviated the need for general surgeons in those areas. It will be increasingly important for general surgeons to be proactive in the area of new medical technology so that they are able to envelop technological change instead of being excluded from it.

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50 Years Ago

(continued from page 218)

benefits varying from $6.00 to $16.00 will be paid during the period of disability after seven days. Maternity care is provided, including a cash benefit if the mother is not gainfully employed and if prenatal care is received as prescribed by the board, a cash allowance of $15.00 will be made to the mother on the birth of her child.

To finance the system compulsory payroll deductions and employer and State contributions totalling from $1.10 to $1.20 weekly per individual will be collected. Payments from employees and employers will be made by the purchase of stamps. With commendable candor it is pointed out in a footnote to the Bill that it is contemplated that the federal government through grants-in-aid will reimburse the State for one-half of the required payments.

Administration is provided in the State Department of Health through a Health Insurance Commissioner who is not required to be a physician, and a commission of thirteen of which only three shall be physicians, including two general practitioners and one specialist. This board shall have power to make regulations governing the system, appoint district medical officers and supervisors and collect the tax.

It appears that payment to physicians and others will be left to the discretion of the administrative board as will also the qualifications of physicians and the standards of care.

Sub-Section 18, nearly at the end of the Bill is of interest:

"Federal Cooperation. 1. The board is hereby designated as the agency of the State to administer and expend any and all grants of money allocated or made available to the State under any federal act for grants-in-aid for health insurance or for any of the purposes of this act. The board is hereby authorized to do any and all things, not inconsistent with law, necessary to meet the requirements of the said federal act."

Thus do coming events cast their light shadow.

—Editorial by Creighton Barker

Editorial

Animal Research and the Practicing Physician*

Busy practitioners, should they read basic research articles at all, are unlikely to get very excited unless one of the topics specifically interests them. And who can blame them? It's difficult enough to keep up with biomedical literature that is directly relevant to the care of their patients, much less worry about work which at first glance seems pretty esoteric. Yet practitioners are also fully aware of the fact that the quality of the care they provide depends in the long run on basic investigations many of which are necessarily conducted in laboratory animals. As a gastroenterologist, I recognize that my colleagues in practice are very likely to ask whether a wet-bench laboratory experiment will ultimately lead to major advances in the management of gastric distention, peptic ulcer, or inflammatory bowel disease? Will they generate additional research which yields new concepts about mind-gut interactions or immune-mediated alterations in small bowel motility? The chances are that no single basic research project will necessarily lead to a major advance in clinical medicine, but no one can deny the possibility that an investigation involving laboratory animals might open exciting new vistas which directly relate to the care of patients.

One does not need to look far to find seemingly esoteric research which has ultimately turned out to be enormously important to clinicians and their patients. In my own field, for example, a paper[1] describing the effects of different analogues of histamine on the contractility of loops of ileum or pieces of right atrium obtained from rats; or a report[2] concerned with a potassium-stimulated phosphatase activity detected in a microsomal fraction of homogenized frog gastric mucosa; or experiments in which the concentrations of hydrogen and sodium ions were measured in Heidenhain pouches of dogs before and after topical application of eugenol;[3] or measurements of the sugar-splitting activities in preparations of brush borders isolated from the surface of hamster small intestine.[4] Hardly the kind of stuff to cause physicians or their patients to dance in the street. Yet these investigations ultimately led to histamine H_2 blockers, to agents capable of completely shutting off gastric acid secretion by blocking the hydrogen ion pump in parietal cells, and to the recognition of the pathogenesis of gastric mucosal injury and disaccharide induced diarrhea. Were it not for studies of the metabolism of sulfasalazine in germ-free rats,[5] we would not know how that agent worked or what its active ingredient was. One could continue down an endless list that includes items varying from the isolation of biologically active peptides from frog skin to using non-human primates to identify viruses responsible for hepatitis, but there's no need for further tabulation. Those in my field who care for patients recognize full well that animal research had made possible virtually everything they do, whether it's as routine as sedating a patient for endoscopy or as complex as transplanting a liver. And the same is true for practitioners in all other branches of medicine.

Yet how ironic it is that in this golden age of biomedical research, when laboratory animals have never been so important, animal research is under such siege. What began more than a century ago in Victorian England as the "antivivisectionist" movement has evolved into what is now called "animal rights." Whatever name one uses for this movement, its supporters have united to form a well-funded and powerful political action group with one goal in mind: the eradication of research using experimental animals. They do battle on three readily discernible fronts. First, they argue directly, as did their forebears more than a century ago, that the use of animals for research is morally wrong, is no longer of scientific value, and must be stopped. Because this approach has had so little impact over the years, those who would do away with animal research have taken a second and more sophisticated tack. They are attempting to regulate it to death with federal, state, and local initiatives designed to make research in animals prohibitively impractical and expensive. Proposals by the United States Department of Agriculture for implementing recent animal rights legislation and regulations provides one terrifying example of this approach. The most militant members of the movement are leading the third prong of the attack. This consists of either overt sabotage of existing animal research facilities, as occurred in 1987 at the University of California at Davis and in 1989 at the University of Arizona, or actions designed to prevent the construction of biomedical research laboratories, as has occurred recently at the University of California at Berkeley and at Stanford.

Always slow to organize and respond, the biomedical research community is now beginning to recognize the multifaceted, very real and very dangerous threat which animal research is likely to face to an increasing extent during the next decade. No matter how well motivated and appropriate initiatives coming from academicians may be, though, they are not likely to make much difference if they come only from the biomedical research establishment, and can be summarily dismissed as self-serving. What legislators and public administrators will

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pay attention to will be the voices of practicing physicians and their patients. In the interests of those who have benefited from the fruits of animal research in the past and those who will continue to benefit in the future, the time to speak out is now. Whether as individuals or as members of supportive lay organizations, patients and their families must enlist now and become committed advocates for animal research. It is their doctors who are in the best position to educate and recruit them. A dialogue between practicing physicians and their patients is crucial and should not be delayed.

Whether researcher, physician, or patient, we must all take it upon ourselves to convince the general public that ethically conducted, properly monitored animal research is the legitimate enterprise of trained, responsible investigators, that those who are morally opposed to all animal research have no business regulating its quality, and that purposeful disruptions of responsible animal research must not and will not be tolerated.

Practitioners and their patients want and need high quality biomedical research, some of which must necessarily be conducted using laboratory animals. There are times and places when it seems better to avoid or defer issues than to confront them, but when it comes to animal research in today's world, this is neither the time nor the place. Never was it more important for all of us to take our stand at every opportunity.

Robert M. Donaldson, Jr.

Yale University School of Medicine
New Haven

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Around the State

Conferences

The topic of the Third Annual Rheumatology Symposium is "Lyme Disease: A Model for Inflammatory Arthritis." This symposium, sponsored by the section of Rheumatology, Department of Medicine, Yale University School of Medicine, will be held in the Mary S. Harkness Auditorium on Wednesday 23 May 1990. Registration will begin at 8:15 A.M.; John A. Hardin, M.D., will open both the morning and afternoon sessions. For more information call the Office of Postgraduate and Continuing Medical Education at (203) 785-4578.

An evening conference entitled "Establishing Institutional and Practice Policies for the AIDS Patient" will be held in the Keller Auditorium at the University of Connecticut Health Center on Wednesday 13 June 1990. The conference, a continuation of the series, Legal, Ethical, and Medical Controversies in Health Care, is sponsored by the Division of Humanistic Studies, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, and the Ethics Committee of Hartford Hospital. Barbara B. Blechner, J.D., and Patrick B. Friel, M.D., are course directors. Leonard H. Glantz, J.D., professor of health law at Boston University Schools of Medicine and Public Health will give the keynote address.

For more information call Barbara Blechner, J.D., at (203) 679-2356.

Immunization Program

The Connecticut Department of Health Services through its Immunization Program has provided to private practitioners MMR, OPV, Td, and DTP vaccines at no charge to insure that the vaccine is readily available to those for whom the cost of vaccine would be a deterrent to immunization. The program has been highly successful in protecting the health of our most precious resource, our children.

To review the conditions of the program: 1) An administration fee of $15.75 is allowed but no fee may be charged for the vaccine; 2) doses administered must be reported by broad age categories on designated forms; and 3) severe adverse reactions to the vaccine must be reported. Discussion with parents of the risks and benefits of the vaccine is certainly advisable. The Department has published "Important Information" forms to help in this regard.

It is vital that we look again at our obligations to this Immunization Program to insure its continued success in its present form. Some knowledgeable patients have questioned how carefully we observe the $15.75 administration fee. An explanation of your fees, and an itemized bill, may help to dispel such doubts and reassure your patients.

The President's Page

National Practitioner Data Bank

It's the law. The National Practitioner Data Bank came into existence as part of the Health Care Quality Improvement Act of 1986. Final regulations were published in the Federal Register October 17, 1989. Scheduled to open in April 1990, full operation has been delayed while the necessary computer systems are completed by the Unisys Corporation. The intent of accumulating data in the Bank is to protect the public by identifying physicians and dentists, and later other licensed health care practitioners, who are incompetent or demonstrate improper professional conduct. Of importance to us is how the data will be collected and, more importantly, how it will be used.

The information to be reported is outlined in considerable detail in the published Regulations. Three broad categories of actions are reportable: medical malpractice payments made by an insurance company or self insured entity; licensure actions taken by Boards of Medical Examiners related to professional competence or conduct; and adverse actions on clinical privileges taken by a health care entity, after professional review, that adversely affects privileges for longer than 30 days or surrender of privileges while under investigation. Reports of medical malpractice must reach both the State Licensing Board and the Data Bank within 30 days on forms supplied by the Data Bank. Those on adverse actions are due at the State Licensing Board in duplicate in 15 days with a copy to be forwarded to the Data Bank within another 15 days. A report is sent then to the physician or dentist who is allowed 60 days during which factual errors may be challenged. Reporting entities which fail to comply are subject to financial penalties and other sanctions.

Of interest is how the data will be used. Hospitals must request information from the Data Bank when a physician or dentist, later other health care practitioners, requests clinical privileges and every two years after that for those having clinical privileges. These same individuals may request information about themselves at any time. A health care entity may access information in the course of professional review activities. Some types of person non-specific information will be available to researchers, especially to support medical liability and malpractice research. An attorney who has filed a medical malpractice claim in court may obtain information relating to a particular case in litigation if it can be shown that the hospital did not properly request information from the Data Bank before awarding and subsequently renewing clinical privileges.

The expectation is that the Data Bank will identify incompetent physicians, dentists, and other health care practitioners, promote effective professional peer review; and improve the quality of health care. That seems a long way off right now. Confusion remains about the operation of the Data Bank. More details about its function and, perhaps, a period of observation are needed before its impact can be judged.

At present, many questions are left unanswered. Can confidentiality be assured when one considers the number of people at State and Federal levels who process the information and the many who must or may request it? Will there be more litigation at the local level as physicians or dentists challenge, with the aid of their attorneys, professional peer review boards in their hospitals or medical societies? Does an unfavorable report in the Data Bank compromise an individual's ability to receive a clinical appointment or help the medical staff arrive at a better decision? Will the time and effort expended by health care entities in reporting and requesting data improve the quality of health care or is it all just another addition to the hidden administrative cost of health care?

Roger S. Beck, M.D.
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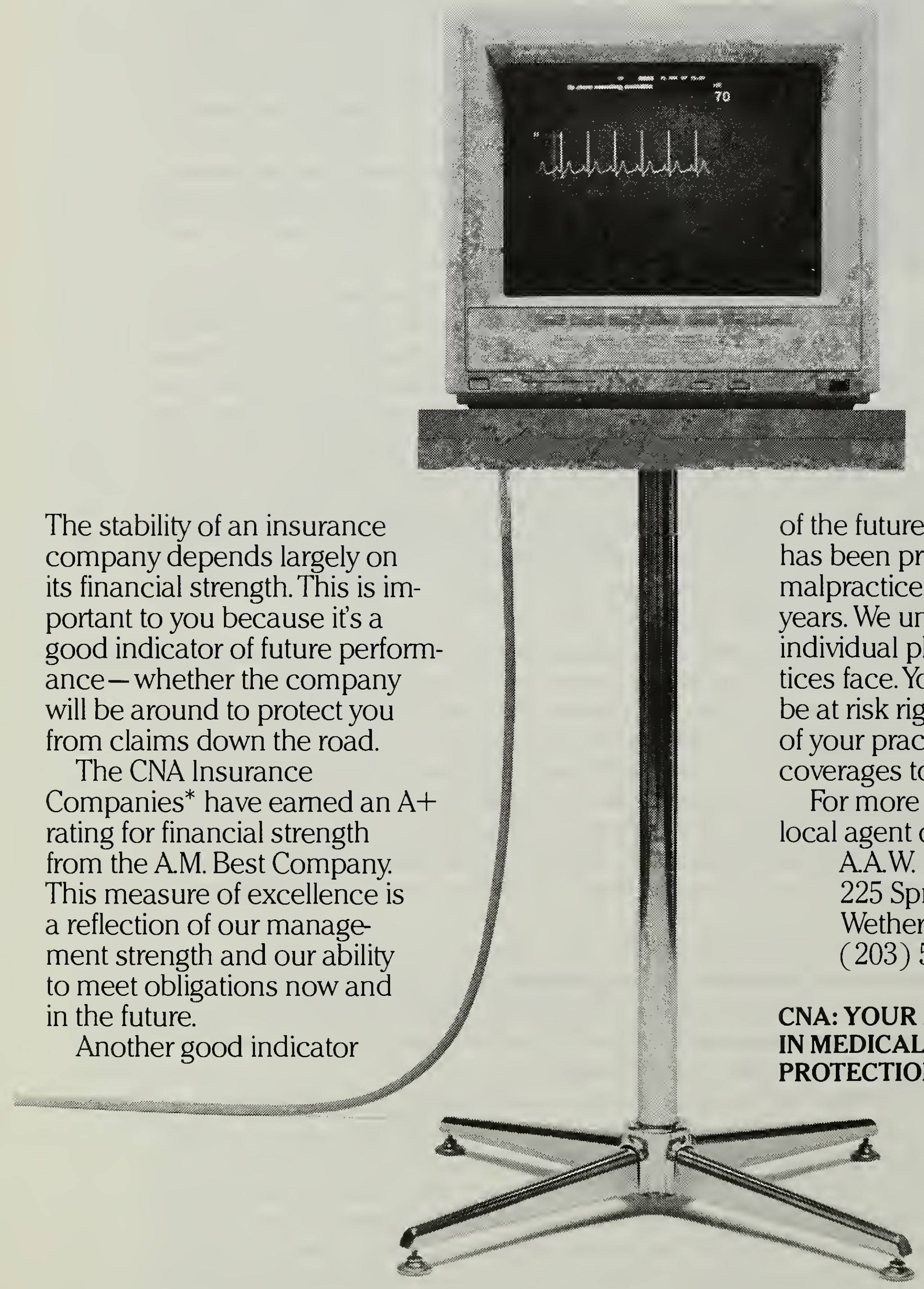

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ROBERT U. MASSEY, M.D.

While my dog and I were inspecting the sand, salt, and other residues on the lawn left by a winter now mercifully gone, a neighbor stopped to talk. I could tell that medicine, not the weather or lawn care, was on his mind. He had consulted a new internist about some symptoms that had been troubling him for a month or so, and had been assured that all was well. I congratulated him, but he had more to add; I wished I had chosen the woods back of the house to inspect, but too late now.

"He ordered two or three hundred dollars worth of lab work before he ever saw me. Then I filled out a medical questionnaire he had sent. At the office his nurse went over it with me again, mostly repeating the questions."

"But then he talked it over with you, and did a physical exam, didn't he?" I asked, afraid that I would be embarrassed trying to deal with his answer.

"Not really. His nurse did most of the exam. He looked at my chart for a while, asked if I was worried about anything. He seemed in a hurry. 'All the tests are fine, cholesterol's under 200, that's what matters, he said. 'Watch the weight. Blood pressure's up a little—cut back on the salt.' He got up, shook my hand, and that was that!"

"It's always comforting," I said, trying hard to be cheerful and reassuring, "—nice to know that everything's OK." I did not want this to go on—he would be talking about the bill next, and I was wondering whether a rectal or fundoscopic examination had been done — wondering but would never ask. I was saved by the arrival of some other neighbors commenting about how bad the moles were this year.

My thoughts went back 42 years to an episode during rounds with my chief, Frank Sladen, at the Henry Ford Hospital. We had just seen a newly admitted patient and Dr. Sladen noted that I had ordered a fasting blood sugar and a blood urea nitrogen.

"Why did you order those tests?"

"She was a little overweight, and got up at night to urinate once, sometimes twice." I could sense what was coming.

"You did a urinalysis last evening and spun it down and looked at the sediment, I see. You wrote that it was negative. The blood tests, of course, will be normal, unless there's a lab error. They will cost her ten dollars. That's almost her daily wage."

Nothing more was said. The test results were normal, of course, and I recall nothing more about this patient, but I had learned an important lesson.

Laboratory tests are relatively cheaper now; 40 years ago not only did the cost of those two tests equal a day's wages, they were more than half of the hospital's daily room rate. That was part, but only part, of the reason why interns were expected to do the blood counts, urinalyses, bleeding and clotting times, stool quaiacs, spinal fluids, and sputums. This would be inefficient now, a misuse of manpower. But is taking a careful history, doing a complete physical examination *before* ordering laboratory work a waste of the physician's time? No lab work may be needed.

Perhaps with an automated laboratory, indiscrimate testing for nearly everything is efficient, and asking the patient to fill out a history form may give an impression of thoroughness. Assigning the physical examination to a skilled nurse may be cost effective. In theory, this sytem should leave at least 30 minutes, maybe an hour, for the patient to talk with the physician about why he sought help in the first place. It would provide time, I recall once hearing, for the doctor to do what doctors do best. But that too may be unnecessary in an automated world; why not just fax a computerized summary of the findings along with an incomprehensible but detachable bill that can be sent to the third-party payer?

It is easy enough to appear cynical about all of this, forgetting the remarkable advances made in medicine in the last four decades. Not everyone sees these matters as clearly as we do, however, and, what neighbors tell me represents a skewed sample, but by listening too much to our managers we may be losing our way as well as our patients' trust.

ROBERT U. MASSEY, M.D., Professor, Division of Humanistic Studies in Medicine, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington.

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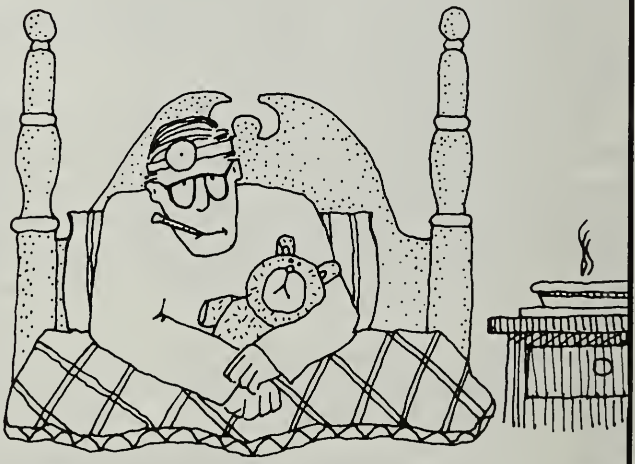

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Is an Embryo Really a Child?

JOSEPH M. HEALEY

As a conclusion to the discussion of the *Davis* case[1] this column will focus on three remaining points: (1) Judge Young's conclusion that the frozen embryos were children whose best interests required that they be made available for implantation to assure their opportunity for live birth; (2) Judge Young's implementation of his conclusion; and (3) the implications of the case for the concept of "preventive law."

Judge Young's conclusion in *Davis v. Davis* that the frozen embryos were children whose best interests required that they be made available for implantation has been criticized by many commentators including Professor John Robertson, one of the experts who testified at the trial. Professor Robertson has written:

> Judge Young's conclusion that four-celled preimplantation human embryos are "children" and "human beings" is unprecedented and unwarranted. It has no discernible basis in common law precedents nor in Tennessee law (which recognizes a separate legal interest in prenatal human life only at viability). It is a view rejected by highly respected ethical advisory bodies in the United States, Great Britain, Canada, France, and several other countries.
>
> This remarkable conclusion appears to represent the judge's own personal view of the significance of the biologic fact that a new human genome exists at or shortly after fertilization. But genetic uniqueness and potential to develop into a newborn infant does not mean that a human entity—the preimplantation embryo—is already a "child" or "human being" with rights and interests of its own.
>
> The terms "life" or "human life" contain a central ambiguity that the judge ignored. While the preimplantation embryo is clearly human and living, it does not follow that it is also a "human life" or "human being" in the crucial sense of a person with rights or interests. Indeed, such a ruling could lead to a ban on embryo freezing and even superovulation because of ensuing damage or nontransfer of "in vitro children."[2]

Even if one ignores such criticism and accepts the Judge's conclusions, how the Judge carried out his conclusions would still be disturbing. If the embryos were indeed children whose best interest should determine which parent gains their custody, then there should have been an evidenciary hearing to justify an award to mother or father. Furthermore, remaining issues in family law should have been discussed, if not resolved. Instead, the Judge awarded temporary custody without much explanation, and left other issues for the future. As Professor George Annas has pointed out:

> Instead of deciding custody, visitation, and support issues (which he would have to if the embryos *were* children), he awards them to Mrs. Davis in exactly the way he would award dresser or a painting.[3]

Finally, one last point should be made about the *Davis* case. The case serves as a poignant reminder of the importance of preventive law. There should have been discussions about how the embryos might be treated, if forseeable changes in the parents' relationship (such as divorce or death) were to occur. These discussions should have been part of the negotiation of the original contractual agreement or of the obtaining of informed consent. The issues should have been presented and agreement should have been reached in advance. As is also the case with medicine, the law is often better at prevention than rehabilitation or cure.

JOSEPH M. HEALEY, J.D., Associate Professor, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington, CT.

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Letters to the Editor

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ASPARTAME: CLINICAL UPDATE

To the Editor: Physicians in Connecticut seeking information about aspartame have been provided incomplete facts and speculation about possible harm from aspartame consumption by Potenza and El-Mallakh.[1] Illustrative of this is the discussion by the authors of the alleged effects of aspartame on congnition which cites an unrefereed preliminary study in four subjects,[2] however, does not cite the numerous studies which have been published showing no effect of aspartame on mood, behavior, cognition, or memory.[3-12] Further, in discussing anecdotal complaints of headache after aspartame consumption the authors mention one study from which it is concluded that aspartame may precipitate headaches[13] while not mentioning another study refuting these claims.[14] Finally, no mention is made of a recent study[15] in which subjects received aspartame at 75 mg/kg daily (equivalent to 10 L of diet beverage daily) for six months without any adverse effects including headaches.

Aspartame is the methyl ester of two amino acids, aspartic acid and phenylalanine, and is metabolized in the gastrointestinal tract to its constituents. These components are then utilized by the body by the same metabolic pathways as when they are derived from meat, eggs, milk, fruits, and vegetables, which contain much greater quantities of these components than contributed by aspartame in foods.[16] For example, a serving of skim milk has approximately six times more phenylalanine and 13 times more aspartic acid than an equal volume of beverage containing aspartame.[17] A serving of some fruit juices contains several times more methanol than an equal volume of beverage containing aspartame.[18] Furthermore, surveys of actual consumption have documented that average aspartame intake by all age groups and special subpopulations, even by heavy users is about 5 mg/kg/day, well below the 34 mg/kg/day or higher conjectured by the authors and also well below the 50 mg/kg/day established by the FDA as the acceptable daily intake, an amount safe to consume on a daily basis for a lifetime![19,20]

Extensive studies in animals and in a variety of human subpopulations, even when amounts of aspartame many times those possible for human consumption are given,[21] indicate that aspartame is not associated with any adverse effects. The unanimous opinion of the regulatory agencies of over 70 countries throughout the world, including the United States Food and Drug Administration (FDA), as well as the AMA Council on Scientific Affairs,[22] is that aspartame is a safe food additive.

Any physician who wishes to receive published scientific information about aspartame can do so by contacting The NutraSweet Company at 1-800-321-7254.

Harriett H. Butchko, M.D.

Associate Director. Clinical Research
The NutraSweet Company
Deerfield. Illinois. 60015

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The above letter was referred to the authors of the article in question, who offer the following reply:

DRS. EL-MALLAKH AND POTENZA RESPOND

To the Editor: Dr. Butchko has brought several recent works to our attention. These papers represent some of the studies we had indicated were needed when we reviewed the literature.[1] Some of these recent works contradict some of the preliminary results we presented. We would like to make two additional points.

In our original paper we discussed several of the cognitive/behavioral studies that Butchko believes we ignored.[1-5] These studies looked specifically at children with attention deficit disorder. We reported that the single report of decreased activity with aspartame[2] has not been replicated, and concluded—as did Butchko—that aspartame does not effect attention deficit disorder. However, it is important that the reader remember that cognition in children is different than in adults, and that many of the higher, integrative functions do not develop until adolescence. Consequently, observations in children may not be generalized to adults. Furthermore, we cited unpublished preliminary evidence[6] because our review led us to conclude that acute ingestion of aspartame probably affects the brain differently than chronic, long-term exposure. It is the latter issue that still needs to be addressed.

Regarding the issue of amounts of aspartame ingested, we cited similar total consumption values as Butchko, but we had attempted to look beyond the issue of total grams consumed. Amino acids are known to compete for carriers and enzymes[7-9] and, with some speculation, one can imagine that ingesting a given quantity of a single amino acid may have a very different effect than ingesting the same amount of that amino acid as part of a meal.

Like Butchko, we concluded that the vast majority of people would *not* have problems with aspartame. However, we also advanced the idea that there may be individuals who are predisposed to being adversely effected by aspartame. Specifically, we suggested that persons heterozygous for a phenylalanine hydroxylase abnormality may be more susceptible to aspartame at doses that do not effect wild type homozygous individuals.[1] We may have highlighted the more rare and unusual reactions because we believe that such cases are intrinsically more instructive than unremarkable ones.

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Lake Shore Hospital
Manchester, New Hampshire 06103

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A HIDDEN COST OF MALPRACTICE

To the Editor: Discussions on malpractice rarely comment upon the psychological strain which a physician and his family suffer through while enduring the ordeal of a malpractice action—an ordeal sometimes intensified and even instigated by a legal system which exploits the natural vulnerabilities that physicians take upon themselves when caring for sick people.

This is not to detract from the suffering of a person who has been hurt by a medical error, but rather to acknowledge that the physician suffers too. Unless we can make the public aware of how inherently harsh we perceive the malpractice climate to be toward physicians, we cannot expect great success from alternative methods of compensation such as arbitration or no-fault insurance.

Edward J. Volpintesta, M.D.
Bethel, CT

BUILDING CATHEDRALS

To the Editor: "Doctors soak the patients but in a few years we will have socialized medicine and they won't be making a million dollars a year." This statement by a retired business executive caused me to bristle as I quickly refuted his remarks. The gentleman had, what he considered, an undesirable result from treatment by his physician. Since then he has maintained a vendetta against the medical profession. Unfortunately he is not alone in his complaints, biased as they may be.

In discussing the public image of the physician the media list the reasons why patients are disenchanted along with case histories of their problems which were not solved or ended in unexpected complications.

"Building Cathedrals" by Dr. Michael Kovalchik *(Conn Med* 1990;54:75-6) should serve to remind everyone, lay persons and physicians, that despite the great changes in medical practice there are doctors who are caring.

I do not think that the day in the life of Dr. Kovalchik is really unusual. However, we are fortunate that he is articulate and interested enough to share his active day along with his thoughts.

In my years of practice I met with many Dr. Kovalchiks although their names were different. It is most unfortunate that the true image of most physicians is not being presented to the public but is portrayed as self-seeking, impersonal, and uncaring.

"Building Cathedrals" by Dr. Kovalchik is such a moving, sensitive documentary of 24 hours in his day that it should not be confined to the readership of a few medical journals but ought to be made available for wide distribution by every state medical association. If permission can be granted then newspapers, radio talk shows, and TV outlets as well as local, state, and national office holders should receive copies of this fascinating article.

Every physician should be encouraged to order reprints for mailing to his patients and stacking on his reception table. If enough doctors light the candle their cathedrals will be brightly illuminated and no longer enshrouded in darkness.

Timothy L. Curran M.D.

Stuart, FL.

In Memoriam

BATES, DAVID H., The Long Island College of Medicine, 1939. Dr. Bates was a general practitioner in the Windham County area since 1940. He was a member of the Windham County Medical Association and the Connecticut State Medical Society; died 29 December 1989 at the age of 77.

HIGGINS, HAROLD W., Tufts, 1932. Dr. Higgins was an obstetrician and gynecologist in the New London County area since 1933. He was a member of the New London County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 12 February 1990 at the age of 83.

KINGSTON, PAUL J., New York Medical College, 1950. Dr. Kingston was a radiologist in the Hartford County area since 1954. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 30 January 1990 at the age of 63.

LOESER, LUCILLE K.,Case Western Reserve, 1952. Dr. Loeser was a psychiatrist in the Windham County area since 1966. She was a member of the Windham County Medical Association and the Connecticut State Medical Association; died 2 January 1990 at the age of 65.

PEPE, ANTHONY J., University of Maryland, 1935. Dr. Pepe was a general surgeon in the New Haven County area since 1936. He was a member of the New Haven County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 8 January 1990 at the age of 79.

RESNIK, EDWARD, McGill University, 1930. Dr. Resnik was an internist in the Hartford County area since 1932. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 27 December 1989 at the age of 84.

UNGER, MILTON, Hahnemann, 1937. Dr. Unger was a gynecologist and general surgeon in the Fairfield County area since 1938. He was a member of the Fairfield County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 15 January 1990 at the age of 79.

ZAVOD, WILLIAM B., Jefferson Medical College, 1929. Dr. Zavod was an internist in the Middlesex County area since 1973. He was a member of the Middlesex County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 24 December 1989 at the age of 89.

ZEMBKO, ANDREW F., Tufts, 1958. Dr. Zembko was an internist in the Hartford County area since 1960. He was a member of the Hartford County Medical Association and the Connecticut State Medical Society; died 11 January 1990 at the age of 57.

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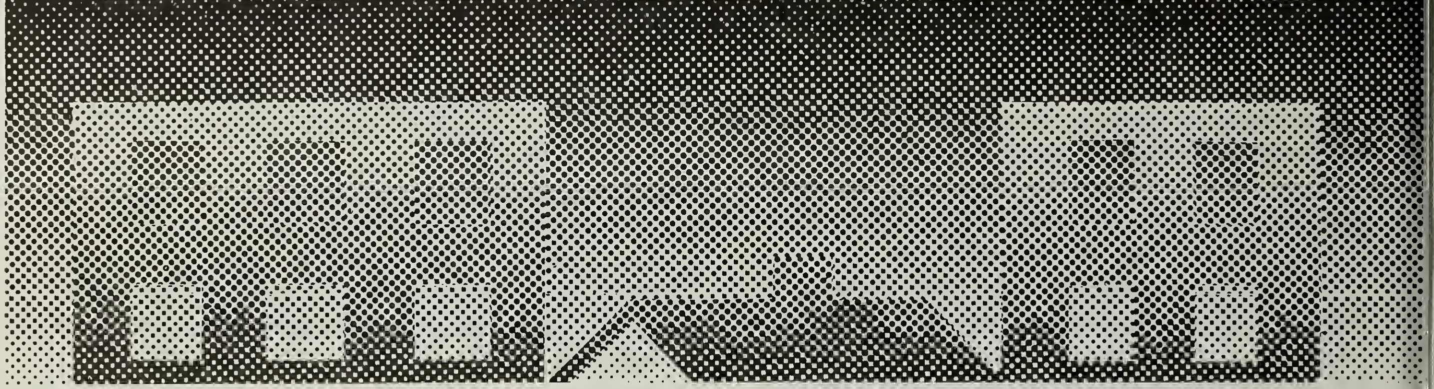

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March '90. Age 36. Nat'l bds. AB cert. MD, Albert Einstein College, Bronx, NY; Int. and Res., Morristown Memorial Hospital, Morristown, NJ. Prefers any type of practice especially group and ambulatory care. Write, Mark Tieman, M.D., 6 Gilbert Lane, Plainview, NY 11803.

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July '90. Age 37. Nat'l bds. AB cert. MD, New York Medical College, Valhalla, NY; Int., Baylor College of Medicine, Houston, TX; Res., New York Medical College; Fellowship, Hospital for Sick Children, Toronto, Ontario; McGill University, Montreal; Sheets and Associates Eye Center, Odessa, TX. Prefers a group practice in a large-sized community. Write, James H. Antoszyk, M.D., 4379 Walkley, Montreal Canada H4B 2K4.

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Aspiration Biopsy of the Prostate: A Community Hospital's Experience

DANIEL C. NIEJADLIK, M.D., ROBERT D. DWYER, M.D., AND
DIANE ROUSSEAU CT (ASCP)

PROSTATE cancer is the second leading cause of cancer mortality in men. The number of deaths in 1989 secondary to prostate cancer is estimated to be 28,500.[1] The incidence of prostate cancer increases more rapidly with increasing age than does that of any other cancer. Although the death rate from prostatic carcinoma remained almost constant, the five-year survival rate has rapidly improved in recent years. It has been observed that patients with a localized tumor survive at a rate twice that of those with disseminated disease. This observation reveals how important early diagnosis is in improving survival of prostate cancer.

Generally, when the patient is referred to the urologist, he either has an elevated prostatic specific antigen (PSA), an elevate prostatic acid phosphatase (PAP), a palpable nodule, or an area of induration. Digital rectal examination of nodules or induration is an easy technique, but is not helpful in distinguishing benign from malignant. The method of establishing the proper diagnosis is by an adequate prostatic biopsy. Previously, core biopsy specimens were performed with large-bore needles for histological study. This procedure often necessitated general anesthesia. In the 1950s, Franzen and associates in Sweden reported on the use of fine-needle aspiration for the diagnosis of prostatic cancer rather than using the core biopsy.[2] Only recently, however, has this become a generally accepted and used procedure in the United States.[3] The lack of experience with this technique among urologists, and among pathologists in the interpretation of the smears, were at the root of this inertia.[4]

Methods

Specimens studied were from material aspirated from the prostates of 158 patients between November 1986 and January 1989. Two urologists were primarily responsible for the majority of the specimens submitted. Although four pathologists were involved in the interpretation of the smears, approximately 90% of these cases were read by the same pathologist. In the initial evaluation of the aspiration biopsy, core needle biopsy was performed immediately after the procedure. Within a few months the correlation was considered excellent and the simultaneous needle core biopsy was discontinued. In addition, serological markers for prostatic malignancy such as PAP and PSA were performed prior to the biopsy.

For purposes of this study, a specimen was considered to be positive if malignant cells were present, suspicious if cells suggesting cancer were present, benign if no cellular material indicating malignancy was present, and inadequate if material lacked cells or was too scant for interpretation.

A patient was considered to have a positive follow-up if (1) the biopsy was positive, (2) x-ray or bone scans were positive for metastatic disease, (3) serological markers were three times the upper limits of normal, or (4) metastatic disease was found in another organ. A negative follow-up was defined if none of the above were present.

The sensitivity of the test is defined as the likelihood that the patient has a malignancy when the aspiration biopsy is positive. The specificity is defined as the probability that the patient will not have a malignancy when the aspiration biopsy is negative.

For calculating sensitivity and specificity, only those cases which met the definition of positive and negative follow-up were used. Sensitivity was calculated by dividing the number of true positive cases by the true positive and false negative. Specificity was calculated by dividing the true negative cases by the true negative cases plus the false positive.

Results

In our study we evaluated the aspiration biopsies in 165 patients and in only five was the material unsatisfac-

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DANIEL C. NIEJADLIK, M.D., Pathologist, Department of Pathology; ROBERT D. DWYER, M.D., Urologist, Department of Urology; DIANE ROUSSEAU CT, (ASCP), Cytotechnologist; all of Middlesex Memorial Hospital, Middletown.

Table 1

POSITIVE - 47 Cases

1. PATIENTS BIOPSIED (23):
    - a. 18 Adenocarcinoma
        - 2 Metastatic Carcinoma
        - 1 Poorly Differentiated Carcinoma
        - 2 Positive Nodes - X-Therapy
2. STAGING ONLY (24)
    - a. Stage B - 7 Cases
        - Stage C - 2 Cases
        - Stage D - 15 Cases

tory for diagnosis. Initially 101 cases were considered negative, of which four, on later examination, were found to be positive. Review of the false negative smears did not reveal any positive cells to be present. Some of the 101 cases have been followed up to a period of three years and have yet to exhibit any signs of malignancy.

There was a total of 47 cases considered to be positive. In all 47 cases malignancy was confirmed either by a core biopsy, prostatic removal, elevated serological markers PAP, PSA, or X-ray studies indicating malignancy.

In a closer examination of the 47 cases considered positive, 23 were biopsied, 18 were found to have adenocarcinoma of the prostate. Two had positive nodes upon exploration and two had metastatic carcinoma to other organs. Clinical staging was used as a criterion for malignancy in the other 21 cases because of elevated serological markers, PSA and / or PAP, and radiological studies. In the clinical staging, seven were considered to be stage B, two stage C, and 15 cases stage D (See Table 1).

Table 2

SUSPICIOUS - 12 Cases

1. (8) Rebiopsy - POSITIVE
2. (1) Rebiopsy And Needle Biopsy - NEGATIVE
3. (3) Nothing Further Done

Initally 12 cases were considered to be suspicious. Reaspiration performed on eight of these cases revealed the aspiration biopsy to be positive, which was confirmed either by tissue removal or clinical staging. In one of the cases a rebiopsy and a needle biopsy were negative. In three of the 12 cases, no further follow-up was performed as the patients either left the area or did not return for an appointment (See Table 2).

In the 101 cases considered to be negative, 11 had prostatic removal. In seven cases there was benign prostatic hyperplasia, and four had carcinoma and were considered false negatives (See Table 3).

Table 3

BENIGN - 101 CASES	
1. Cancer on Turp	(4)
2. Prostatitis	(2)
3. BPH	(7)

Discussion

Table 4 consists of a selection of published reports from the literature on aspiration biopsy.[5] Sensitivity ranges from 6% to 100% and specificity from 80% to 100%.

Table 5 provides an overview of the correlation between cytology and clinical staging or histology. With the exclusion of the three cases that were suspicious without adequate follow-up, and the unsatisfactory smears, there was a total of 157 patients followed. Excluding the suspicious cases and the unsatisfactory cases, Table 6 indicates that in our hands the initial aspiration biopsy had a sensitivity of 100% (47/47) and a specificity of 97% (97/101). The sensitivity and specificity would not have appreciably changed if the reaspirations performed on patients with suspicious biopsies had been included in the statistics.

Table 4
Selected Published Reports of Aspiration Biopsy Biopsy of the Prostate Listed Chronologically

Reference No.	*No.*	*Pos.* *True*	*False*	*Neg.* *True*	*False*	% Sensitivity	% *Specificity*
# 1	82	59	3	20	0	100	87
# 2	350	205	5	119	21	91	96
# 3	95	49	2	42	2	96	95
# 4	51	33	0	15	3	92	100
# 5	174	61	12	97	4	94	95
# 6	108	43	23	36	6	88	64
# 7	152	37	1	13	1	97	99
# 8	281	48	25	22	8	86	89
# 9	454	141	71	180	62	69	72
#10	122	34	16	71	1	99	82
#11	68	15	4	45	4	79	92
#12	124	34	16	68	6	85	80
#13	195	127	5	61	2	98	92
#14	122	51	10	58	3	94	85
#15	102	54	11	36	1	98	97
#16	97	56	5	33	3	98	87
Graham Study	133	56	4	61	12	82	94
MMH Study	151	47	0	97	4	100	97

Our results indicate that fine needle aspiration biopsy can have acceptable levels of sensitivity and specificity if performed in a community hospital where the volume of material is adequate and the interest of the pathologist is present: We conclude that:

1. Fine needle aspiration should be encouraged as a standard part of the diagnostic armamentarium of the urologist.
2. The performance of the aspiration biopsy can be considered accurate, safe, and only moderately uncomfortable.
3. False positives are rare.
4. Any atypical or suspicious cytology should be repeated.

Table 5
Correlation Between Cytology and Clinical Staging or Histology (N = 157)

	Histology/Staging		
CYTOLOGY	*NEGATIVE*	*POSITIVE*	*TOTAL*
Negative	97	4	101
Suspicious*	1	8	9
Positive	0	47	47
Total	98	59	157

*3 Suspicious-No Follow Up

Table 6
Analysis of Cases Diagnosed By Aspiration Cytology

Cytology Results	*Prostatic Cancer*	*No Prostatic Cancer*
Cancer	47 (TP)	0 (FP)
No Cancer	4 (FN)	97 (TN)
Totals	51	97

Sensitivity - 100% - 47/47

Specificity - 97% - 97/101

Aspiration biopsy is a relatively inexpensive and accurate diagnostic tool in the early detection of prostatic cancer.

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AIR FORCE

Brain Abscess: A Review

KAREN L. ROOS, M.D.

A brain abscess is a focal suppurative process within the brain parenchyma that becomes manifest by headache, focal neurological signs and symptoms, vomiting and seizure activity. Despite advancements in neuroimaging, the availability of potent antimicrobial agents and sophisticated neurosurgical techniques, the morbidity and mortality from brain abscess remains high. Outcome is affected most by rapid diagnosis and early intervention.

Etiology

A brain abscess may develop in any of the following clinical settings: 1) by direct spread from a contiguous cranial site of infection; 2) following cranial trauma, either surgical or accidental; 3) as a result of hematogenous spread from a remote site of infection; and 4) cryptogenic (in approximately 20% of cases).[1]

The most common predisposing condition leading to the development of a brain abscess is direct spread of bacteria from a contiguous cranial site of infection such as otitis media, odontogenic infections, frontal sinusitis or mastoiditis, or by retrograde septic thrombophlebitis from these sites of infection.[2] The primary etiology of the infection determines the causative organism and the location of the abscess within the brain.

Abscesses that develop as a result of direct spread of infection from the frontal, ethmoidal or spenoidal sinuses are usually found in the frontal lobes. The majority of otogenic brain abscesses develop in the temporal lobes, followed by the cerebellum.[1] The occurrence of a brain abscess as a complication of otitis media has a bimodal age distribution, with a peak in the pediatric age group secondary to acute otitis media and a second peak after age 40 associated with chronic otitis media.[3] Brain abscess develops as a complication of chronic otitis media and mastoiditis four to eight times more frequently than as a complication of acute infection in these areas.

Brain abscesses that develop from paranasal sinusitis occur predominantly in the 10-30 year age group. The majority of brain abscesses that develop from dental sepsis occur in the frontal lobes and are the result of a recent extraction of a molar tooth. Anterior dental infections drain into the oral cavity and rarely result in a brain abscess.[1]

Metastatic abscesses that are the result of infection elsewhere in the body can occur throughout the brain, but tend to form primarily in areas supplied by the middle cerebral artery (i.e., posterior frontal or parietal lobes). These abscesses are usually located at the interface of gray-white matter where capillary blood flow is slowest. Chronic pyogenic lung diseases are the most common associated infections, but wound and skin infections, endocarditis, osteomyelitis, and intraabdominal and pelvic infections also may be the source of a brain abscess.

A common cause of brain abscess in infants and children is cyanotic congenital heart disease, with Tetralogy of Fallot and transposition of the great vessels being the most frequent anomalies cited. As a general rule, a brain abscess develops only in an area of necrosis. A predisposing factor to brain tissue necrosis in cyanotic congenital heart disease is polycythemia, which causes intravascular thrombosis and reduces the rate of blood flow in the microcirculation of the brain, leading to brain hypoxia or infarction. In addition, the presence of a right-to-left shunt precludes the filtering of virulent bacteria by the lungs. Bacteria reach the brain and are able to establish infection in areas of focal cerebral damage from microinfarction and reduced tissue oxygenation.[1,2,4,7]

Pathology

Results of animal experiments suggest that for bacterial invasion of brain parenchyma to occur, there must be preexisting or concomitant areas of ischemia, necrosis or hypoxia in brain tissue.[4] The intact brain parenchyma is relatively resistant to infection.[8] Once bacteria have established infection, brain-abscess formation evolves through four stages, regardless of the infecting organism. These stages have been described from animal models of brain abscess, and have been shown to correlate well with human brain abscess evolution as observed by

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computed tomography imaging *(Table 1)*. These stages are: early cerebritis, late cerebritis, early capsule formation, and late capsule formation.

The early cerebritis stage (day 1-3) is characterized by perivascular infiltration of inflammatory cells composed of polymorphonuclear leukocytes, plasma cells and mononuclear cells which surround a central core of coagulative necrosis. Marked cerebral edema surrounds the lesion at this stage.

In the second stage, late cerebritis (days 4-9), the necrotic center has reached its maximal size and is surrounded at its border by an inflammatory infiltrate of macrophages and fibroblasts. The appearance of fibroblasts and the marked increase in new vessel formation around the developing abscess set the stage for capsule formation. A thin capsule of fibroblasts and reticular fibers gradually develops, and the surrounding area of cerebral edema becomes more distinct than in the previous stage.

In the third stage, early capsule formation (days 10-13), the necrotic center begins to decrease in size and the inflammatory infiltrate changes in character, containing an increasing number of fibroblasts and macrophages. Mature collagen evolves from reticulin precursors, forming a capsule that is better developed on the cortical than on the ventricular side of the lesion.

The final stage, the stage of late capsule formation (day 14 on), is characterized by a well-formed necrotic center with a peripheral zone of inflammatory cells and a dense collagenous capsule. The surrounding area of cerebral edema has regressed, but marked gliosis with large numbers of reactive astrocytes has developed outside the capsule.[2,4,8,10]

This sequence of events is altered in the immunocompromised host and may be slightly affected by the predisposing condition leading to infection. Encapsulation is more extensive in abscesses that arise from a contiguous site of infection compared to abscesses that result from hematogenous spread of infection. It is suggested that the hypoxic infarction resulting from a septic embolus might impede optimal collagen formation.[1,9,11] An additional important observation is the quantitative difference in the formation of the capsule between the cortical and ventricular sides of the abscess, with more complete capsule formation on the cortical than on the ventricular side, resulting in a tendency for spread of infection to the ventricle rather than to the subarachnoid space.

Table 1
Correlation of Histopathology with CT Scan:
Appearance of Experimental *S. Aureus* Brain Abscess

Histopatholigoc Stage/ Characteristics	***CT Scan Appearance***
Early Cerebritis	*Early Cerebritis*
1. Perivascular infiltration of inflammatory cells surrounding a central area of coagulative necrosis	1. Low density lesion with faint contrast enhancement at the lesion's edge
	2. Delayed scans* show diffusion of contrast into the low-density center
Late Cerebritis	*Late Cerebritis*
1. Necrotic center has reached its maximal size and is surrounded by an inflammatory infiltrate	1. Larger low density lesion than in the early cerebritis stage
2. Rapid new vessel formation around abscess	2. Prominent ring enhancement following contrast administration
	3. Delayed scans continue to reveal diffusion of contrast into the low density center
Early Capsule Formation	*Early Capsule Formation*
1. Necrotic center decreases in size and the inflammatory infiltrate changes in character	1. The area of low density and the diameter of ring-contrast enhancement has decreased in size.
2. Capsule forms that is better developed on the cortical than on the ventricular side of the lesion	2. There is no significant inward diffusion of contrast on delayed scans
Late Capsule Formation	*Late Capsule Formation*
1. Well-formed necrotic center surrounded by a peripheral zone of inflammatory cells and a dense collagenous capsule	1. The low-density lesion is surrounded by a sharply demarcated, dense ring of contrast enhancement

*Delayed scans obtained 30 minutes after infusion of intravenous contrast. Adapted from 4, 8-10.

Microbiology

The organisms most commonly isolated from brain abscesses *(Table 2)* are streptococci, staphylocci, Bacteroides and members of the *Enterobacteriacea (Proteus sp., Escherichia coli,* and *Pseudomonas sp.).*The clinical setting and the location of the abscess within the brain predict the etiological agent. Various streptococci (aerobic, microaerophilic, anaerobic) are the causative organisms in 60-70% of cases. A frontal lobe abscess that develops in association with sinusitis usually is caused by streptococci.[1] *Bacteroides sp.* and the *Enterobacteriaceae* usually are isolated in brain abscesses of mixed culture, and are infecting organisms in 20-40% and 23-33% of cases, respectively.[1,12,16] Both are common infecting agents in mixed culture abscesses that develop from frontoethmoidal and sphenoidal sinusitis and otitis media. *S. aureus* causes 10-15% of brain abscesses, usually in pure culture, and is the most common pathogen in abscesses that result from cranial trauma, either penetrating wounds of the brain or neurosurgical procedures.[1-2] Except in the neonate, brain abscess formation is a rare complication of pyogenic meningitis. In the neonate, brain abscess formation has been reported in association with more than 70% of cases of *Citrobacter diversus* meningitis. Other bacteria occasionally isolated from brain abscess pus include *Clostridium, Fusobacterium, Actinomyces,* and *Listeria monocytogenes.*[1,17]

A much smaller percentage of brain abscesses are caused by fungi. Fungal intracerebral abscesses occur

Table 2
Microbiologic Etiology of Brain Abscess*

Organism	*Isolation Frequency (%)*
Staphylococcus aureus	10-15
Enterobacteriaceae	23-33
Streptococcus pneumoniae	<1
Hemophilus influenzae	<1
Streptococci *(Streptococcus milleri, Streptococcus anginosus)*	60-70
Bacteroides species	20-40
Fungi	10-15
Protozoa, helminths	<1

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primarily in diabetics, immunocompromised patients and parenteral drug abusers. The most common fungal infection of the CNS is *Cryptococcus neoformans*; however, most infections with this fungus are subacute and present with symptoms of meningitis.[18]

Aspergillus sp., Candida sp., and *Blastomyces dermatitides* infections are more likely to present as intracerebral mass lesions. *Candida* brain abscesses usually are seen in the setting of disseminated disease. *Aspergillus* brain abscesses are almost always associated with invasive pulmonary disease.[1] Although helminths rarely are the causative agents of brain abscess in patients in the midwestern part of the country, brain abscess due to *Taenia solium* (neurocysticercosis) is occasionally seen in patients who ingest undercooked pork.

The presence of multiple deep cerebral abscesses in patients with the acquired immunodeficiency syndrome (AIDS) is characteristic of infection caused by *Toxoplasma gondii.* Of the 15 reported cases of patients with AIDS and *M. tuberculosis* infection of the CNS, 10 of these patients presented with CNS mass lesions.[18]

Signs and Symptoms

In children and adults, the most common symptom of brain abscess is headache, either hemicranial or generalized, and occurs in over 75% of patients.[8,9] More than half of patients will have complaints of vomiting, or focal neurological deficit, the most common of which is hemiparesis. Brain abscess presents as an expanding intracranial mass lesion, rather than as an infectious process, as such, fever is present in only 45-50% of patients and usually is not striking.[1] One-third of patients present with new onset focal or generalized seizure activity.[8,20] Frontal lobe abscesses are more prone to produce seizures than those in other locations.[8]

The findings on neurological examination are related both to the site of the abscess and to the presence of raised intracranial pressure (ICP). In cases of frontal or parietal lobe abscess, hemiparesis is the most common localizing sign. Patients with temporal lobe abscess may have language disturbance or an upper homonymous quadrantanopsia. Cerebellar abscess is manifest by nystagmus and ataxia. Patients with expanding mass lesions and increased ICP will have alterations in consciousness ranging from lethargy to irritability, confusion or coma. There may be papilledema, and deficits of cranial nerves III and VI, if raised ICP is present. Patients with brain abscess may present with signs of meningitis if the abscess ruptures into the ventricle, or if the infection spreads to the subarachnoid space.

Infants with brain abscess will present with seizures, irritability, failure to thrive or an enlarged head.[7]

Diagnosis

Patients with brain abscess may have a leukocytosis or an elevated erythrocyte sedimentation rate; however, in a significant proportion of patients, laboratory criteria for infection will be lacking.[8,21]

When a brain abscess is suspect, examination of the cerebrospinal fluid (CSF) should be avoided because of the danger of herniation of the brainstem, and because the diagnostic yield is low. In one series, lumbar puncture was performed in 140 patients with brain abscess. In 41 patients, there was significant deterioration in the level of consciousness in the subsequent 48 hours with 25 patients dying.[22] In another series, four of 27 patients with brain abscess who underwent lumbar puncture died within 24 hours after the procedure.[23] Although it is regarded as safe by some to perform lumbar puncture if only a small amount of CSF is removed, the inadvertent creation of a hole in the theca after the needle is withdrawn may allow for slow seepage of CSF, resulting in clinical deterioration several hours after the procedure. Therefore, lumbar puncture should not be performed in patients suspected of having a brain abscess.

Unless there has been extension of the abscess to the meninges or ventricles, bacteria can be detected by Gram stain or culture of CSF obtained by lumbar puncture in less than 10% of patients.[23,24]The presence of an elevated cell count in the CSF is directly related to the stage of encapsulation of the abscess and its proximity to the meningeal or ventricular surfaces, and thus may range from a few to several hundred cells.[25] The protein content is moderately elevated, up to a few hundred milligrams per 100ml, in patients with unruptured abscesses.[8] The CSF glucose should be normal. The finding of hypoglycorrhachia indicates that the meninges have been breached by bacteria.[25]

Computed tomography (CT) is the diagnostic procedure of choice to identify acutely ill patients with brain abscess. The appearance of a brain abscess on CT is characteristic *(Figure 1A-1C).* Typically, the abscess is a low-density lesion with a sharply demarcated, dense ring of contrast enhancement surrounded by a variable hypodense region of edema. In both the cerebritis stage and the stage of actual capsule formation there is a marginal ring of density on contrast enhanced images; however, in the cerebritis stage the enhancing ring forms an inhomogeneous "halo." As the abscess matures, its margin becomes more discrete and the associated en-

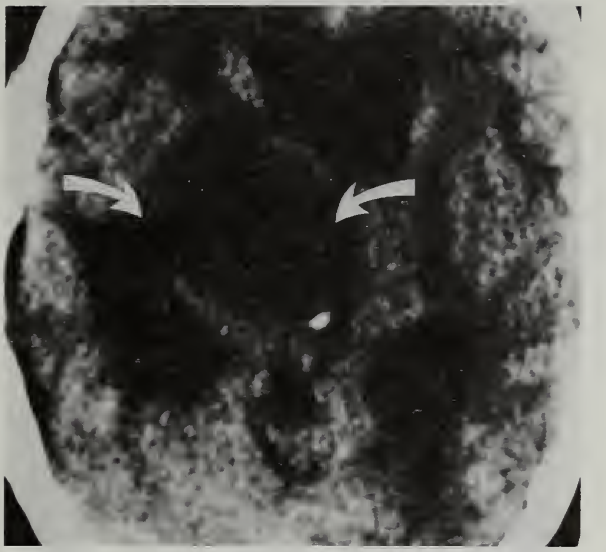

Figure 1A
Axial noncontrast CT. Low ventricular level. Focal low density lesion arising from the right thalamus (arrow).

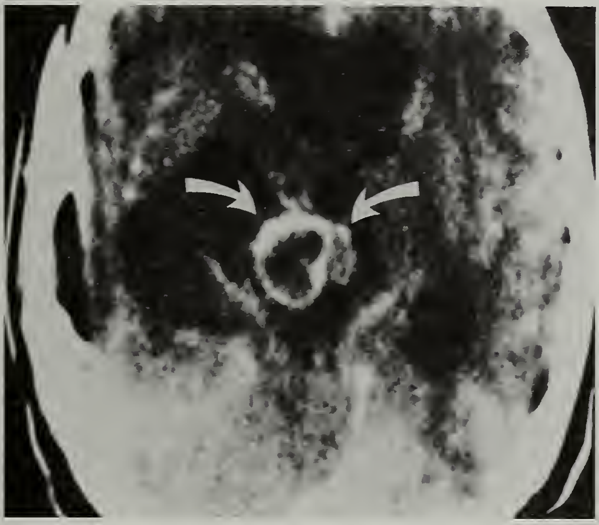

Figure 1B
Corresponding contrast study reveals enhancing lesion with surrounding edema (arrows). These findings are consistent with abscess.

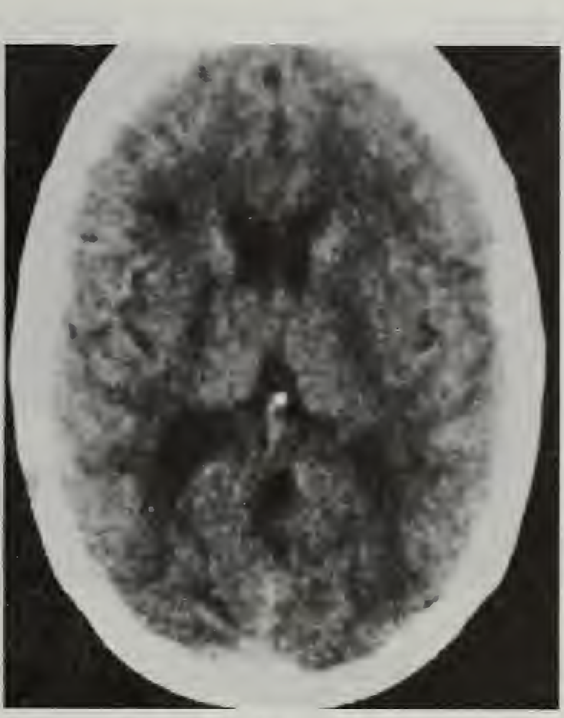

Figure 1C
Axial CT. Low ventricular level six months later demonstrates complete resolution of abscess.

hancement more homogeneous. In addition, there is often diffusion of contrast medium into the low-density center of an abscess in the cerebritis stage. The CT scan is also particularly well suited for the evaluation of the paranasal sinuses, mastoids and middle ear, common sites of initial infection.[1,9,26]

The efficacy of magnetic resonance imaging (MRI) in the detection of brain abscess has been studied experimentally in canine and monkey brain-abscess models. The results of these studies suggest that MRI may be superior to CT in detecting lesions early in the cerebritis stage. The use of a paramagnetic contrast agent, gadolinium—DTPA (Gd-DTPA) in T1-weighted images, may add specificity in characterizing brain abscess on MRI.[27-28] At present, primarily because of its availability, the CT scan is the procedure of choice, although an abscess also can be readily demonstrated by MRI *(Figure 2A-2C).*

Treatment

Medical therapy

Systemic antibiotic therapy alone often is successful in eradicating brain abscess by CT scan in the cerebritis stage and lesions less than 3 cm in diameter.[29] Haley, *et al.*, using a combination of penicillin and chlorampenicol early in the cerebritis stage, were able to sterilize experimental *S. aureus* brain abscess in rats.[30] Rosenblaum, *et al*[29] and Heineman, *et al*[31] reported patients with brain abscesses who were cured with medical therapy alone. In their patients, antibiotics were initiated early and the brain abscesses were small. If the CT scan suggests the lesion is in the cerebritis stage and less than 3 cm in diameter, and the patient is neurologically stable, high dose antibiotic therapy can be initiated and the patient observed.

The choice of an antibiotic to treat a brain abscess must not only be made based on the susceptibility of the organism, but also must include consideration of the antibiotic's ability to penetrate the blood-brain barrier, and to penetrate and be effective in brain abscess pus. An antibiotic's ability to penetrate the blood-brain barrier is dependent upon several factors, including: 1) degree of lipid solubility, 2) degree of ionization, 3)pH-gradient between plasma and CSF, 4)protein binding, and 5)molecular size and structure of the antibiotic. More important than the pharmacokinetics of an antibiotic in enabling the CSF-blood barrier is the presence of inflammation in the meninges. A moderate degree of meningeal

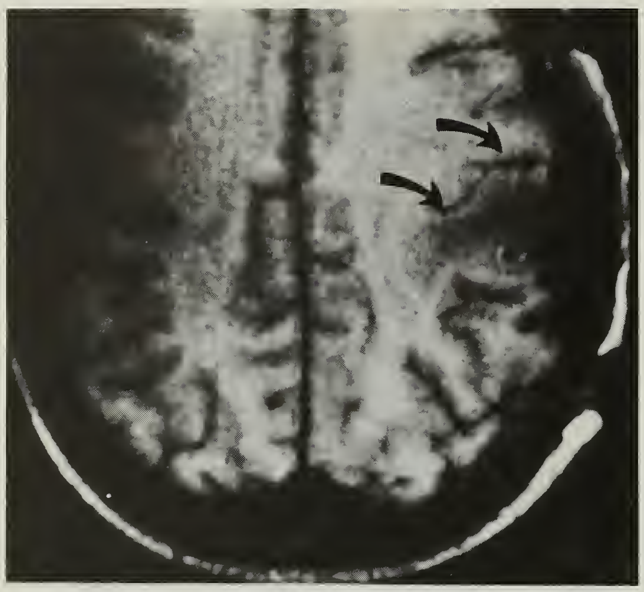

Figure 2A
Axial MRI. T_1-weighted scan through parietal convexity. Focal area of decreased signal peripherally (arrows).

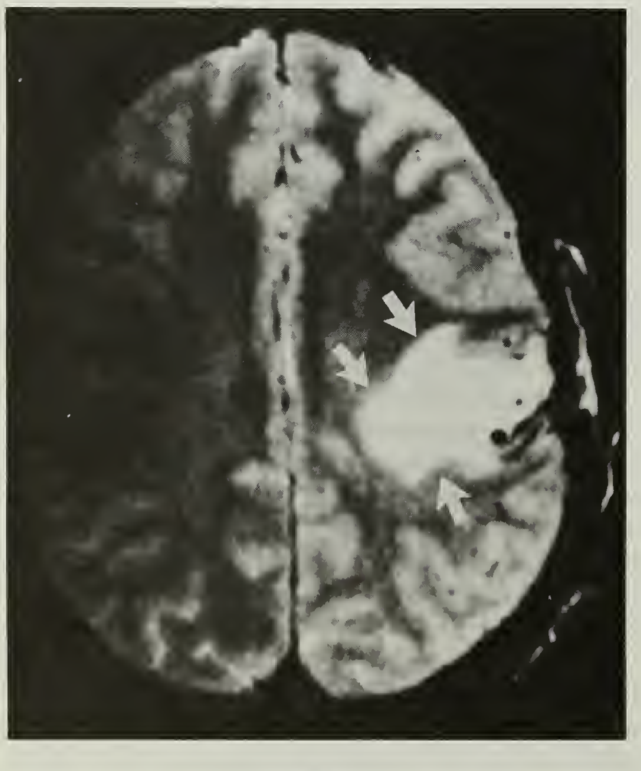

Figure 2B
Axial MRI. T_2-weighted scan (parietal convexity) demonstrates a hyperintense lesion (arrows).

inflammation results in a marked increase in the capacity of many antibiotics to cross the blood-CSF barrier.[2,32,33]

The penetration of antibiotics into brain tissue, in particular into brain abscess, is less well understood than the penetration of antibiotics into CSF. To some degree, the same factors that limit the penetration of antibiotics into CSF limit the penetration of antibiotics into brain tissue. In addition, the permeability of antibiotics into brain tissue is enhanced by the local inflammation and the alteration in the blood-brain barrier that occurs in areas of cerebritis. Finally, despite the presence in the abscess cavity of therapeutic concentrations of antibiotics, organisms persist in the purulent core. This persistence of viable organisms in abscess pus despite the presence of therapeutic concentrations of antibiotics has been attributed to inactivation of antibiotics by bacterial or leukocytic enzymes accumulating in the abscess pus. For this reason, antibiotic therapy alone is usually not successful once an abscess has developed a purulent core.[23]

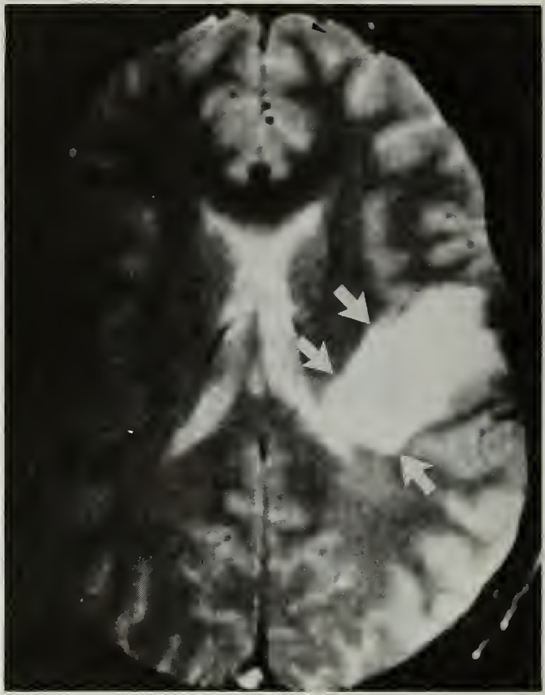

Figure 2C
Axial MRI. T_2-weighted scan (midventricular level). Lesion extends to periventricular region (left).

For empiric therapy of brain abscess, a combination of penicillin G (20-24 million units daily) plus chloramphenicol (1.0-1.5 g intravenously q6h) is recommended. A third-generation cephalosporin (cefotaxime or moxalactam) should be added to this regimen if *Enterobacteriaceae* are suspected. Pencillin has excellent activity against streptococci and most anaerobes, with the notable exception of *Bacteroides fragilis*. Chlorampenicol penetrates well into brain tissue and has excellent activity against anaerobic bacteria. Metronidazole obtains high concentrations in brain abscess pus and is bactericidal against strict anaerobic bacteria, including *B. fragilis*, but its CNS side effects have limited its use.[1]

When staphylococci are suspected or grown, nafcillin (2g q4h) is recommended. Vancomycin is recommended for patients who are allergic to penicillin or in whom a methicillin-resistant strain of staphylococci has been isolated. Fusidic acid penetrates brain abscess cavities well and is not readily inactivated by brain abscess pus. There are several reports in the European literature of successful therapy of *S. aureus* brain abscess with fusidic acid, but experience in this country has been very limited.

Surgical therapy

An abscess beyond the cerebritis stage should be managed by aspiration or excision. The advantages of aspiration are: 1) it decreases the size of the intracranial mass, and in this way decreases ICP, and 2) by removal of the purulent material in the core of the abscess, may decrease the likelihood of inactivation of antibiotics by bacterial or leukocytic enzymes in the pus. The risks of aspiration are that it may allow the abscess to rupture into the ventricle or leak out into the subarachnoid space.[34] Aspiration may provide only temporary benefit. Persistent bacteria in the core of the abscess will generate an ongoing inflammatory response, and aspiration may be ineffective in reducing ICP.[4,34]

Excision is the definitive procedure and should be undertaken when antibiotics and aspiration cannot control the infection, and when there are lesions that are greater than 4 cm in size on CT scan.[9] Excision is contraindicated in the early stages of the abscess, before a capsule has formed, and where an abscess is deep in the brain or in vital structures. A major complication of excision is the likelihood of a permanent neurological deficit. With the use of the CT scan and ICP monitoring devices, an increasing number of patients have been successfully managed with systemic antibiotic therapy and aspiration of the abscess alone.[8,35-36] Because of the risk of a permanent neurological deficit with excision the surgical method preferred for children and infants is drainage or repeated aspiration.[20,37]

The use of steroids in the management of brain abscess is controversial. A major threat to the patient's life in the presence of a brain abscess is the effect of the expanding mass leading to increased ICP and herniation of the brainstem. Steroids decrease endothelial permeability of the vessels associated with the inflammatory response around the abscess, and subsequently decrease cerebral edema.[4] However, this effect on the permeability of the vessels may result in decreased diffusion of antibiotics into the abscess.[4,23] Steroids also have been shown to cause a reduction of polymorphonuclear leukocytes at the infected focus with delayed clearance of bacteria. There is no evidence that steroids either delay or augment encapsulation of an abscess.[38] When increased ICP is a concern, a short course of steroids in addition to hyperventilation and mannitol is indicated.[39] The proper timing and appropriate dose of steroids in the management of this infection is presently unknown.

Morbidity and Mortality

Since 1975, there has been a significant reduction in mortality from brain abscess reported in all series.[7,10,20,37] This reduction has been atttributed to improvement in culture technique with better identification of the infecting organisms, and to the contribution CT scanning has made in the diagnosis and management of this infection.[7,40] Mortality of brain abscess in recent series has ranged from 0 to 24%.

The major morbidity from brain abscess is associated with surgical intervention, and includes permanent neurological deficit and postoperative epilepsy. The incidence of neurologic sequelae, including minor and incapacitating deficits, is reported to be between 30 and 55%.[23,41] The incidence of postoperative seizure disorder ranges from 30-50% in reported series, the onset of which may be delayed from six to 12 months following surgery.[19,42-43]

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Abstracts by Residents and Fellows

AMERICAN COLLEGE OF SURGEONS, CONNECTICUT CHAPTER

FOREWARD: The American College of Surgeons, Connecticut Chapter, held its annual meeting on 14 December 1988. The papers selected for presentation for the Annual Resident Trauma Competition are abstracted below. The moderator was Dr. Christopher Baker, Chief of Trauma, Yale University School of Medicine and the judge, Dr. Alasdair Conn, Associate Professor of Surgery, Boston University School of Medicine.

Kirk K. Kazarian, M.D., F.A.C.S., Chief of Surgery, Department of Surgery, Stamford Hospital.

Trauma, Alcohol, and Seat Belt Survey: We Can See the Enemy

MARK A. COLQUITT, M.D., LINDA DEGUIRIS, M.S.N., BETTY MASSA, M.A.,
and L. P. FIELDING, M.B., Department of Surgery, St. Mary's Hospital, Waterbury

In the U.S.A., 40,000 motor vehicle trauma deaths occur annually of which 50% have been attributed to alcohol. In Connecticut a new seat belt mandate was introduced in 1986 with a reported rise in seat belt usage from 30% to 80% between 1985 and 1987, and a lowering of severe injuries from 1.8% to 0.9% for the same time period.

Under the auspices of the Connecticut State Trauma Committee, a prospective survey was conducted over a four-week period (12/14/87 to 1/11/88) to investigate seat belt usage, measurement of blood alcohol concentration (BAC), and the utility of injury severity scoring (ISS) for all patients sustaining motor vehicle trauma.

Principal Results (1,358 forms returned)

	Seat belts used	*BAC performed*	*BAC > 100 mg%*	*ISS used*
Information recorded	643/1,283 (50.1%)	182/1,270 (14.3%)	101/150 (67.3%)	599/1,358 (44.1%)
Patients admitted	29/114 (25.4%)	60/118 (50.9%)	37/53 (69.8%)	62/121 (51.2%)
Patients discharged	548/1,038 (52.8%)	108/1,060 (10.2%)	58/84 (69.1%)	502/1,086 (46.2%)
Missing information /patients/	131	92	13	151

SUMMARY: Of the patients admitted to the hospital: 1) BACs were carried out in distressingly small numbers; 2) ISS was underused and appears not be understood in many emergency rooms except by those institutions specially trained in its use; 3) Seat belt usage as reported by patients is substantially less than that claimed by state authorities.

CONCLUSION: Patients are not being adequately served by our current systems. We recommend: 1) that all motor vehicle accident victims being admitted have a blood alcohol measurement performed, 2) that emergency room personnel be trained in the use of the ISS system, and 3) that state authorities be informed of the inadequate implementation of the law concerning seat belts.

Vasopressor Responsiveness in Well-Compensated Endotoxicosis

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Infection remains the most common cause of morbidity and mortality in trauma patients surviving the initial period of resuscitation. Vasopressor hyporesponsiveness during this period has been well documented clinically and in the laboratory. We assessed the effects of phenylephrine, a potent vasoconstrictor, in normotensive, well-compensated sepsis.

Endotoxemia (E) was induced by injecting 14 New Zealand white rabbits acutely (0.5% mcg/kg six hours prior to study) and 11 rabbits chronically (1.0 mcg/kg every 12 hours for three days) with *E. coli* lipopolysaccharide. Eighteen *de novo* rabbits served as controls. Cardiac index (CI) was measured by thermodilution and regional blood flow (RBF) was determined by radioactive microspheres. Hemodynamic data and blood flow were determined before PE (baseline, B) and at infusion of 31 mcg/min (PE).

Conclusions: Vasopressor hyporesponsiveness in endotoxic shock may require up to 30 times the dose of pressor used in controls to effect equivalent changes in mean arterial pressure (MAP). In our model of well-compensated sepsis, this phenomenon was not observed. While the MAP achieved in the acute endotoxemic group was significantly lower than control, the change in MAP was nearly identical.

Myocardial dysfunction in sepsis is a well described entity. In this study, myocardial blood flow was maintained in acute E and chronic E at baseline and during PE infusion, suggesting that ischemia is not responsible for shock. These data further suggest that there is change in hypotensive sepsis which prevents vasoconstriction to pressors. Whether this is due to direct myocardial effect, a circulating mediator, or a change at the receptor level remains to be elucidated. Future investigations will be of value in understanding the pressor resistant septic shock state which results in greater that 50% of late trauma fatalities.

1. MAP:	Mean Arterial Pressure
2. CI:	Cardiac Index
3. SVRI:	Systemic Vascular Resistance Index
4. Heart RBF:	Heart Regional Blood Flow

The Impact of Connecticut Drinking Age Legislation on Alcohol-Related Trauma in Adolescents

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Between 1982 and 1985, the legal minimum drinking age (LMDA) in Connecticut was gradually raised from 18 to 21. A major justification for this legislation was that it would lead to a decrease in the rate of alcohol-related injury fatalities, particularly motor vehicle fatalities in the adolescent age group.

In order to determine the effectiveness of this legislation, we compared motor vehicle fatalities in the 16-20-year-old age group in Connecticut with those in Vermont, which maintained a minimum legal drinking age of 18 during the period studied. We also looked at 4,178 admissions for injury to a level I trauma center and compared the proportions of alcohol-related injuries in this age group during the time periods before and after the legislation took effect.

There was no significant difference in total motor vehicle fatalities in Connecticut in the years before and after the change in LMDA. There were differences in individual age groups and for certain types of fatalities. The 18-year-old age group experienced a 40% decrease in fatal crashes ($p<0.02$). The 16 to 17-year-old age groups had a reduction of 45% in single vehicle nighttime fatal crashes ($p<0.05$). Nineteen-year-olds had a 36% reduction total nighttime fatal crashes ($p<0.05$). There were no significant differences in fatal crash involvement between adolescents in Connecticut versus Vermont.

The review of alcohol-related injuries in adolescents requiring admission to a level I trauma center before and after the enactment of LMDA legislation demonstrated no significant change in the proportion of alcohol-related injuries in the adolescent age group.

High Frequency Jet Ventilation (HFJV) in the Multiply-Injured Patient

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Adequate mechanical ventilation of multiply-injured patients is often crucial to their survival. Conventional ventilation (CMV[2] or IMV[1]) may be unsatisfactory for some of these patients because of toxic Fi02[3] levels or high levels of PEEP[4] needed to maintain oxygenation and satisfactory pulmonary dynamics. HFJV[5] has been suggested as appropriate to improve gas exchange and pulmonary dynamics in such patients. Six multiply-injured trauma patients treated with HFJV at a level-one trauma center during one year are retrospectively reviewed. Patient characteristics, mechanisms of injury, TS, ISS, types of injuries, cause of acute respiratory failure (ARF), indications for HFJV, days on HFJV, gas exchange, and PIP on conventional and HFJ ventilators were analyzed for each patient. Among this group, age averaged 34 years, TS 9, and ISS 48. Indications for HFJV were ARF requiring high Fi02 and PEEP in three patients. ARF and barotrauma in one patient, and hemodynamic instability in two, improvement in gas exchange and decreased PIP was obtained in five patients, with two of them developing hypercarbia after two and three weeks on the HFJV.

Pt. #	*Vent Rate*	*Fi02 (%)*	*PEEP*	*PO^2*	*PCO^2*	*Airway Pressures*
1	IMV/CMV 18	80	18	60	40	48
	HFJV 300	52	—	184	24	27
2	IMV/CMV 23	100	14	116	22	30
	HFJV 300	50	—	218	20	27
3	IMV/CMV 20	80	8	79	43	30
	HFJV 300	56	—	80	35	33
4	IMV/CMV 18	50	20	55	45	52
	HFJV 100	60	—	63	27	42
5	IMV/CMF 30	50	10	98	34	42
	HFJV 350	59	—	64	31	50
6	IMV/CMF 12	60	10	98	34	42
	HFJV 360	60	—	153	20	30

At this time it would appear that in addition to the use of HFJV in patients with major air leaks from bronchial and pulmonary parenchymal injuries, HFJV can be beneficial in a select group of multiply-injured patients with ARF requiring excessive levels of Fi02 or PEEP and/or hemodynamic instability.

1. IMV: intermittent mechanical ventilation
2. CMV: controlled mechanical ventilation
3. F_iO_2(%): percent oxygen of inspired air
4. PEEP: positive end-expiratory pressure
5. HFJV: high frequency jet ventilation

Psychosocial and Behavioral Impact of Pediatric Trauma

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Increasing clinical sophistication has improved the understanding and management of pediatric trauma, but the psychological effects experienced by these children have been less well studied.

We hypothesized that the morbidity associated with significant trauma in pediatric patients may result in psychological and behavior abnormalities persisting well after the physical damage has healed.

We sought delayed behavioral and emotional abnormalities in pediatric patients with (1) multiple trauma without severe head injury (N=40); (2) multiple trauma without head injury (N=40); (3) emergency appendectomies (N=40).

The method used involved a questionnaire administered to the families of the children. Statistical analysis was by chi square comparison of each group with post-appendectomy patients.

	Behavioral Problems	*Emotional Problems*	*All Disturbances*
MH	45% **	18%	48% **
MT	27% *	14%	27% *
EA	0%	0%	0%
	$^*p<0.001$	$^{**}p<0.001$	

Twenty-seven percent of the children surveyed in Group MT displayed significant post-traumatic behavioral and emotional dysfunctions while none were seen after appendectomy. These changes included phobias, major scholastic difficulties, and depression. These results suggest that multiple trauma in the pediatric patient population results in frequent and severe changes in children's behavior. The increased incidence of disturbances in children with mild head injury in addition to other trauma may stem from undiagnosed neurological sequelae, specific psychological reaction to head injury, or to a higher level of trauma in children who suffer from head injury. This awaits further exploration. A prospective study is now in progress to confirm and more extensively characterize these disturbances in traumatized children with and without head injury. However, it seems clear even from this retrospective review that emotional complications may be as debilitating as physical trauma in severely injured children. A coordinated multidisciplinary approach from emergency room to outpatient convalescence is needed to assess these children accurately and may mitigate their disability.

Nonoperative Management of Splenic Trauma: Persistent Abnormalities on Nuclear Scan

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Between January 1985, and September 1988, 20 children with splenic injury secondary to blunt trauma were managed nonoperatively and followed by technetium sulfur-colloid scan. The age range of patients studied was two to 18 years with a mean age of 10.1 years. The criteria for nonoperative management included: (1) hemodynamic stability with or without the need for fluid resuscitation; (2) stable hematocrit; (3) progressive improvement of abdominal examination. The diagnosis of splenic injury was made or confirmed by nuclear scan in all but one patient in whom CT scan was used to evaluate other intra-abdominal viscera. Scans were routinely obtained at periodic intervals between one week and six months following injury as part of a regular follow-up in all patients. At seven days following injury, five of nine patients studied showed some improvement, while the defect was unchanged in the other four patients. The earliest documented improvement was at three days, while at two weeks, the splenic defect had regressed in 19 of 20 patients. The earliest scan showing near complete resolution was at five weeks, while the earliest documented normal scan was at seven weeks after injury. By 20 weeks, five scans were completely normal, four demonstrated minimal residual defects, while the remainder had significantly improved. Significant defects were observed as late as 46 and 70 weeks after injury. There was no correlation between the extent of the initial defect and eventual resolution. Clinical improvement was observed in all patients by one week following injury, and all have returned to full activity without secondary complications or splenic reinjury. This study demonstrates the variability of eventual resolution in the nuclear scan following splenic injury despite complete clinical recovery. The nuclear scan has limited application in long-term follow-up of splenic injury except when progressive enlargement of residual defects is encountered.

The Continuing Dilemma of Screening for Thoracic Aortic Injury in Blunt Trauma

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Thoracic aortography (TAO) is the only reliable method reliable to diagnose major thoracic vascular injury, but it is not without risk or expense. The indications for TAO are enigmatic. The aim of this study was to define selection criteria for TAO. A retrospective chart review identified 158 patients who underwent TAO in the two-year interval from May 1984 to May 1986. Eighty-four were drivers in motor vehicle crashes, 21 were passengers, 24 had motorcycle crashes, 12 fell, eight had crush injuries, and nine were pedestrians struck by vehicles. Seventeen (10.8%) had a positive TAO, of which 11 were aortic tears, three were innominate artery injuries, and three had negative explorations for ductus diverticulum.

Severity of mechanism of injury is difficult for the emergency room physician to assess. Thirty-six of 84 drivers had clearly bent or broken the steering wheel/column, yet only three had positive TAO (8%). None of the seven patients with sternal fracture had positive TAO. Clinical assessment was made and the abbreviated injury score (AIS) for injuries to the thorax was determined. Injury severity scores (ISS) were calculated for each patient. The mean AIS-thorax in patients with positive TAO was 2.6, versus 1.9 in those with negative TAO (statistically significant by student's T test $p<.05$). With an AIS-thorax of three, 10 of 63 patients (16%) had positive TAO. With an AIS-thorax of two, only seven of 95 patients (7%) had positive TAO. Mean ISS in patients with positive versus negative TAO was 18.9 and 17.8, respectively.

Chest films in 80 patients were reviewed in double blind fashion by four attending radiologists, and TAO was recommended in 49 cases on the basis of radiologic findings. Five of these 80 patients had major vascular injuries, and all five were in the group of 49 selected for TAO by the radiologist.

In summary, mechanism of injury alone was not a reliable indication for TAO. Clinically, in patients with major deceleration injury and AIS-thorax of three, emergent aortography is indicated. If AIS-thorax is two or less, and if the plain film is not suggestive of aortic injury by the reading of an experienced radiologist, patients can be followed clinically with serial chest films.

The Effect of Hemodilution of HIV Assays Following Massive Fluid Resuscitation

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After making the observation that a known HIV positive patient apparently become HIV negative by ELISA and Western Blot testing following massive fluid resuscitation for a stab wound to the heart, we reviewed the literature and found that there were several reported cases of organ transplant from ELISA negative donors in which the recipients of the organs developed AIDS. Although there are known cases of severe immunosuppression in *advanced* AIDS in which the ELISA test becomes negative because of inability to produce antibody, we postulated that in some instances of massive fluid resuscitation, it might be possible to serodilute an HIV positive patient to the point where the HIV ELISA test would be negative. To test this hypothesis, the sera of 19 known HIV positive patients were subject to serial dilutions with saline, and a standard ELISA was then performed on the diluted specimens. Additional dilutions were then performed with 0 negative whole blood and the dilutions tested with the ELISA. Results demonstrate that conversion of a positive to a negative can occur at dilutions well within the realm of clinical feasibility. Two patients reverted at a dilution consistent with loss and replacement of only one blood volume (10 units of packed cell replacement). An additional five reverted from testing positive to negative at a dilution equivalent to two and two and one-half blood volumes (20 and 25 units of packed cells). A total of 11 more patients reverted to negative at four and one-half or five blood volumes. There was no difference in the use of saline or blood.

Effects of Blood Transfusion on the Incidence of Sepsis after Major Trauma

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Sepsis is the leading cause of late mortality after major surgery or trauma. The immune system is impaired in severely injured patients but the nature of this immune depression is incompletely understood. Blood transfusions are common in the trauma setting and have been shown to alter immune function experimentally and in clinical practice. A retrospective review of acutely injured patients was therefore conducted to determine if blood transfusion after injury correlated with subsequent septic episodes.

Charts of patients with recorded injury severity scores (ISS) > 25 (excluding deaths within 48 hours of admission) were reviewed. Of the 20 patients studied, 14 had sustained blunt trauma and six, penetrating injury. The average ISS was 36.5 (range 25-66). Patients were stratified into three groups based on septic complications during their hospital course: major sepsis (bacteremia, pneumonia, infection requiring surgical drainage), minor sepsis (wound or urinary tract infections managed with antibiotics alone), and a "no sepsis" group with uncomplicated courses and no antibiotic therapy after 48 hours.

	Degree of Sepsis		
	Major	*Minor*	*None*
No. of Patients	8	4	8
Units of Blood Transfused (± S.D.)	8.13(±6.36)	2.25(±1.7)*	1.37(±1.7)**
ISS (± S.D.	35.2(±11.1)	33.0(±7.6)	37.6(±11.3)

* p value < 0.07
** p value < 0.02

Conclusion: This retrospective study suggests that the development of major septic episodes following blood transfusion may be added to the growing number of complications of blood transfusions. Frugal use of blood products in the trauma setting is suggested. Prospective investigation is warranted to review the hypothesis that blood transfusion may be sufficiently immunosuppressive to increase the risk of major sepsis after trauma.

Studies into Preventable Trauma Deaths; Confounded Inquiries?

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Evaluation of trauma care within and between institutions has prompted over 30 studies of preventable trauma death in the English literature. They contain many potential confounding factors including lack of method description for case specific judgments, minority consensus, nonindependent review, nonpeer review, unblinded review, and varying case mix.

We compared three consensus methods, using separate five-member general surgery panels to reliably identify preventable deaths in 20 non-CNS fatalities: Group A made independent judgments; Group B made independent judgments and then openly discussed and reassigned all equivocal cases (three out of five panelist agreement); by contrast Group C openly discussed all cases and then made individual judgments. The kappa index of concordance was used to assess inter-rater agreement and chi squared test to analyze differences between groups.

Main Results: (a) Preventable deaths: In method A the kappa index was 0.20 and for both methods B and C, 0.40. Of the 11 cases judged preventable by at least one of the three methods, only one case was judged preventable by all three methods.

Preventable death (agreement of four of five assessors) was 20% for method A; 10% for method B; 45% for method C. The difference between method B and C was significant (Fisher's exact test; $P<0.03$). (b) Equivocal cases: Panel discussion had a significant impact on judgment of equivocal cases. There was a change from 30% to 5% of such cases after group discussion in method B.

Summary: Independent preventable death reviewer agreement is only slightly more than chance in this study. Group discussion influences judgment, and, of greatest importance, different consensus methods yielded different results.

Conclusion: Consensus methods to identify preventable trauma death judgments are flawed. Results of individual case review should not be used for measures of institutional quality of care.

Recommendations: Assessment of institutional performance should be based on (a) the assessment of objective rather than subjective methods of evaluation and (b) studies of patient populations rather than individual cases.

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Causes of Mortality in Massively Transfused Patients

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Massively transfused patients (>12 units packed red cells (PRC) in less than 24 hours) have a high mortality because of underlying injury, but the impact of transfusion therapy per se on mortality is unknown. Transfusion texts focus on electrolyte abnormalities and factor (FFP)/platelet (PLT) replacement, but often ignore the issues of restoration of critical organ perfusion and correction of acidosis and hypothermia (platelets do not function well as temperature decreases). Massively transfused patients without head injury or significant intercurrent medical illness were reviewed in our institution for the period 1981-1988. Forty-five records were available for review. Penetrating injuries occurred in 67% (30/45) and blunt injuries in 33% (15/45). Mean age was 28.5 +/- 4 years; male/female (M/F) ratio was 2.7:1 (33/12). Mean Injury Severity Score (ISS) was 54 +/-6 and the mean number of PRC transfused was 22.5 +/-5. All patients received both PLT and FFP therapy. Overall mortality was 33% (15/45) with 30 survivors (S) and 15 nonsurvivors (NS). When the two groups were compared, no differences in age, M/F ratio, ISS, electrolyte imbalance, or lowest platelet count (58 +/- 7K vs 59 +/-6K) were noted. Adult respiratory distress syndrome developed in 20% (3/15) of the NS group and in 23% (7/30) of the S group. NS received more transfusions (26.5 +/- 9 v 18.6 +/- 1 *), were more likely to have suffered penetrating injury (88% v 55%), had more severe acidosis (pH 7.04 +/- 0.06 *v* 7.18 +/- 0.02 *), lower core temperature (31 +/- 1 °C v 34 +/- 0.5 °C *), and greater incidence of severe coagulopathy despite adequate FFP and PLT replacement (66% or 10/15 *v* 23% or 7/30). Severe hypothermia ($T < 34$ °C) occurred in 30% of the NS group and in 36% of the S group. Severe hypothermia was accompanied by severe coagulopathy in 90% of the cases in the NS group and 22% in the S group. Eighty-five percent of the NS died with or as a consequence of uncontrollable bleeding. Hypothermia may not be a risk factor in the patient who is not bleeding but is a risk factor in the patient who is already coagulopathic. We conclude that therapy in the massively transfused patients should be increasingly directed toward correcting tissue perfusion and restoring core temperature in addition to correcting electroylte imbalance and transfusing PLT and FFP.

(*) = $p < 00.05$

Important Advances in Clinical Medicine

General Surgery

The Scientific Board of the California Medical Association presents the following inventory of items of progress in general surgery. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist busy practitioners, students, research workers, or scholars to stay abreast of these items of progress in general surgery that have recently achieved a substantial degree of authoritative acceptance, whether in their own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on General Surgery of the California Medical Association and the summaries were prepared under its direction.

Advances in Liver Transplantation

LIVER transplantation is the only definitive treatment for end-stage liver disease. The procedure is increasingly common in the United States, with more than 1,680 performed in 1988 compared with 18 in 1980. This increase is stimulated by improved operative and long-term survival rates, most centers reported one-year survival figures of 70% to 80% or better in patients who would otherwise die of diseases such as acute fulminant hepatitis, chronic active hepatitis, primary biliary cirrhosis, sclerosing cholangitis, biliary atresia, and inborn errors of metabolism. Most surviving patients return to their pretransplant activities.

The improved survival rates now reported in large series from many centers relate to several factors. Most important, candidates are referred for liver transplantation earlier in the natural course of their disease, before they reach nutritional bankruptcy, advanced encephalopathy, renal failure, severe coagulopathy, and uncontrolled hemorrhage. Physicians caring for patients with liver disease are learning to avoid a right upper quadrant operation, if possible, in patients who are likely to become liver transplant candidates, especially those with coagulopathies. These factors reduce operative risks. The technical aspects of the recipient operation continue to advance, with several centers reporting decreased operating times, decreased blood usage, and an increased use of autologous blood salvaging devices. Triple-drug immunosuppressive regimens—low-dose corticosteroids, cyclosporine, and azathioprine—are widely accepted now, allowing lower doses of each drug with reduced side effects. The monoclonal antibody OKT3 is used more aggressively to treat steroid-resistant episodes of rejection and in some centers is used for induction immunosuppression immediately postoperatively, especially in patients with renal dysfunction.

The availability of suitable donor organs continues to be a major limiting problem. The state of Oregon adopted a routine inquiry law in 1985, and 43 other states have now passed similar statutes. It is not yet possible to determine if this will help alleviate the problem.

An additional solution to the organ supply problem is the development of techniques for the simultaneous procurement of liver and pancreas grafts despite the common vascular supply. A key development in liver transplantation is the method of the ex vivo preservation of grafts using the University of Wisconsin solution. Many centers are reporting excellent graft function after periods of ischemia of as long as 24 hours compared with 8 hours previously. This solution has not only provided better graft function but also expanded the acceptable donor pool, allowed for further travel to donors, allowed a semi-elective approach to the recipient operation, and lowered costs.

Nowhere is the paucity of size-matched donor organs more devastating than in infants and children. This problem has been addressed recently by reducing the size of the graft with partial hepatectomy and implanting the remaining portion of the graft.

Liver transplantation has forced us to ask questions

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about our capacity to develop new and expensive therapeutic modalities as health care costs increase. The Oregon legislature took a provocative position in this allocation issue by discontinuing Medicaid payment for extrarenal transplantation, a decision they are reconsidering. These ethical issues are important and force society and physicians to scrutinize the cost-effectiveness of new therapies in promising areas of advancement. It is equally important to subject established medical practices to a similar scrutiny.

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Noninvasive Vascular Diagnosis

ADVANCES in the field of noninvasive vascular diagnosis continue at a rate sufficiently rapid to render most summaries of new developments obsolete by the time of publication. A burgeoning technology, coupled with active research efforts in many centers, ensures that the explosive development characterizing this field will continue. The result of this activity is the current availability of a panoply of testing modalities that, taken together, provide a scientific foundation on which to base an objective diagnosis of the presence and severity of arterial and venous disease in all areas of the body.

Duplex scanning, a technique that combines the use of real-time B-mode ultrasound imaging with a computerized analysis of frequency data from pulsed-Doppler signals from the pertinent arteries, has emerged as the technique of choice for evaluating the extracranial cerebral vessels. Using this technique, competent operators can detect both the presence and severity of disease in the carotid and vertebral arteries with an accuracy exceeding 90%. In addition to its important clinical role, duplex scanning is an accurate research method, and data obtained using this technique have been the primary source of our recent improved understanding of the incidence and natural history of carotid artery disease, as well as the outcome of therapy. Sufficient information is available to accurately determine risk categories based on patient characteristics and duplex scan results. The screening of asymptomatic patients with risk factors for cerebrovascular disease is now eminently justified.

The rapid expansion of therapeutic methods being applied to peripheral arterial disease—conventional surgical procedures, balloon angioplasty, laser angioplasty, atherectomy with rotating or cutting tips (or both), thrombolytic therapy, and new pharmacologic agents—mandates the objective assessment of indications and results. Impressive evidence has been accumulated that the prognosis for patients with peripheral arterial disease is more closely related to the magnitude of objective changes in distal extremity pressures and waveforms than to any combination of symptoms or angiographic findings. Similarly, the results of treatment of any type can only be accurately assessed by comparing before and after procedure pressures, waveforms, and treadmill walking distance, rather than by symptoms or by the angiographic demonstration of patency. A major advance in the postoperative follow-up of lower extremity bypass grafts has been the finding that a decreased graft flow velocity, as determined by the duplex scanner, is a reliable indicator of a failing graft that occurs before the loss of distal pulses, a decrease in ankle pressure, or the occurrence of symptoms. This finding has permitted the salvage of many grafts that previously would have failed. It is clear that the diagnosis, prognosis, selection of therapy, and evaluation of the results of therapy in peripheral arterial disease all rely heavily on noninvasive testing for optimal results. Again, regular periodic screening of asymptomatic patients at risk, as well as of those treated both operatively and nonoperatively, is indicated.

The noninvasive evaluation of visceral arteries is prompted by a desire to detect renovascular hypertension and chronic mesenteric ischemia. The recent improvement in duplex scanning instruments, including phased-array ultrasound and color-Doppler imaging, has resulted in improved diagnostic capabilities in this area. Reliable criteria exist to permit the accurate diagnosis of renal artery stenosis. An inability to successfully image the renal arteries of all patients remains a problem, although much less so than with previous instruments. The superior mesenteric and celiac arteries can be imaged and flow data obtained.

The noninvasive detection of venous thrombosis has most often been done by using indirect plethysmography combined with the use of the hand-held Doppler. The improvements in duplex scanners cited earlier have resulted in this direct method being applied to venous diagnosis as well, with greater accuracy. In particular, the use of color Doppler permits the accurate detection of nonocclusive venous thrombosis and the reliable diagnosis of calf vein thrombosis in many patients. The current accuracy of venous thrombosis testing using duplex scanning exceeds 90% and establishes this as the diagnostic procedure of choice.

Testing for chronic venous disease using the duplex scanner, as well as photoplethysmography, permits a reliable detection of valvular incompetence, chronic venous obstruction, and elevated venous pressures. This testing is ideally suited to evaluate indications for, and results of, any venous reconstructive procedure.

The use of the duplex scanner to evaluate renal transplants has resulted in reliable criteria for the noninvasive diagnosis of acute allograft rejection, as well as of arterial and venous thrombosis or stenosis.

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Preventing Postoperative Thromboembolism

THE introduction of the low-dose-heparin concept more than a decade ago seemed to offer the promise of a simple, safe, and effective means of preventing postoperative thrombophlebitis and, more important, of decreasing the risk of related pulmonary embolism. The administration of 5,000 units of heparin subcutaneously two or three times a day was straightforward, and an international cooperative study of thromboembolism prophylaxis following hip operations seemed to verify its effectiveness.

Nonetheless, there has been considerable disillusionment with the concept. We found no apparent benefit in a randomized group of trauma patients. When bleeding complications occurred, they were always considered to be caused by the drug, even though there was no difference in the incidence of bleeding complications in the two groups.

The rationale for using low-dose heparin is that heparin functions primarily as an antithrombin III cofactor, greatly augmenting its antithrombotic effect. The fallacy of this concept is that if a patient has a condition such as disseminated cancer, severe trauma, shock, or major tissue injury, the clotting tendency generated by these states depletes antithrombin III so that heparin is not functional. This difficulty of predicting whether a given dose of heparin will be effective has diminished enthusiasm for its use.

Factors that seem to decrease the risk of postoperative thromboembolism are early ambulation, elastic compression, leg elevation, the administration of dextran, and the use of intermittent pneumatic compression. Of these, early ambulation has clearly established itself as relieving stases and has become a fundamental aspect of surgical care. Maintaining good hydration, thus ensuring good extremity perfusion, is also a basic aspect of care, but its importance has not been as well recognized.

When a patient is bedridden, elevating the limb is beneficial but uncomfortable and difficult to maintain, particularly in elderly patients. Elastic stockings or elastic compression when tight enough to be effective may not be tolerated by a patient.

In severely ill patients, the greater clotting tendency requires more potent therapy. Low-molecular-weight dextran, a viscosity-lowering solution, provides effective prophylaxis. On the day of an operation, 1 to 2 units are administered, followed by 1 unit given daily for the first three to four postoperative days.

Intermittent pneumatic compression has proved to effectively prevent clot formation. The original rationale was that it squeezed blood out of the leg and prevented stasis. It now seems that calf muscle compression works by activating fibrinolysis; hence, the effect may be not only local but systemic. The disadvantages are its cost and patient discomfort.

Finally, there is a group of patients at high risk who have a history of clotting complications. Many of these patients, when studied with sophisticated tests, will be found to have some abnormality of blood antithrombotic or fibrinolytic factors. This group is best treated by carrying out an operation using heparin or sodium warfarin anticoagulation and the bleeding risks accepted. Heparin can be administered by continuous intravenous infusion in amounts sufficient to raise the partial thromboplastin time slightly. With the use of warfarin, the infusion is started several days before the operation and the prothrombin time maintained at 15 to 20 seconds.

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Restoration of Renal Function by Renal Revascularization

RENAL revascularization is most commonly done to ameliorate renin-mediated renovascular hypertension. Recently, however, a growing body of clinical evidence indicates that such a procedure restores significant excretory function as well, even in kidneys that have minimal to nonexistent preoperative function.

The salutary effects of revascularization on renal function were reported in 1960 in eight patients in whom pronounced renal failure was reversed. More recent publications in 1980 and 1985 have documented clinical, biochemical and radiographic improvements in renal function in 47 kidneys that were nonfunctional before revascularization.

The clinical recognition of poorly functioning kidneys most commonly occurs in the course of an evaluation for renovascular hypertension. Laboratory evidence—blood urea nitrogen and creatinine values—of renal excretory dysfunction is absent. Unilateral renal artery occlusion with nonvisualization of kidney parenchyma is seen arteriographically. A less common clinical presentation but one that is important to recognize is a case of hypertension with underlying atherosclerotic vascular disease and laboratory evidence of renal failure. The onset of renal failure is characteristically rapid, and dialysis may be necessary. An arteriogram shows severe bilateral renal artery disease with minimal to no function. This subset of patients benefits most from revascularization because it restores sufficient renal function to eliminate the need for dialysis.

The recognition that revascularization can restore valuable renal function and ameliorate systemic hypertension has changed the surgical approach to patients with nonfunctioning kidneys. Whereas primary nephrectomy was used liberally in the past, it is rarely indicated today. The operative strategy is directed towards revascularizing all kidneys. Such a strategy is possible when the distal and segmental branches of the renal artery are patent and the renal parenchymal length is 5 cm or more. In the few patients where this is not the case, primary nephrectomy is advisable. Revascularization is usually accomplished by an aortorenal bypass. The gastroduodenal artery on the right and the splenic artery on the left may also be employed to revascularize the kidney. Using these celiac branches has the advantage of eliminating the need to cross clamp the aorta, and the operation can be accomplished nicely through a subcostal incision.

The long-term follow-up of patients undergoing revascularization shows considerable late mortality within two years. Death is not related to renal failure since improved renal function is maintained. Rather, coronary artery disease and myocardial infarction are the causative factors. Attention to cardiac risk factors and symptoms is thus important in maximizing the therapeutic benefit of revascularization.

The benefits of renal revascularization on renal function can be substantial, but certain questions remain to be answered, such as what the role of revascularization is in a patient who does not have hypertension but has severe renal artery disease. Many authors think correction of these "asymptomatic" stenoses improves and preserves renal function, but data are lacking to confirm this contention. Can clinical, biochemical, or radiographic preoperative predictors of the successful retrieval of renal function be defined? Several criteria have been proposed to be predictive, but none are absolute. Answers to these and other questions are needed to optimize the therapeutic effects of renal revascularization on renal excretory function.

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Hernioplasty Procedures for Inguinal Hernia

THE treatment of hernias continues to be an important topic in the surgical literature primarily because the recurrence rate following hernia repair remains unacceptably high. The excellent results reported by many authors are unfortunately due to short or incomplete follow-ups and not the skill of a surgeon or the particular technique used for the repair. Patients with recurrent hernias frequently attribute the problem to their surgeon and consequently do not return to that surgeon for repair of the recurrence. This factor gives surgeons a false sense of security in their ability to repair hernias without the complication of recurrence.

The reported incidence of hernia in the United States is 15 per 1,000. The actual incidence is probably substantially higher because a careful physical examination of asymptomatic persons often reveals small inguinal hernias, especially in men and premature infants. In the United States, indirect inguinal hernia accounts for about 50% of hernias. About 25% to 28% of hernias are direct inguinal, 10% to 12% ventral incisional, 6% femoral, 3% umbilical, and 3% are other hernias. Three basic factors, alone or in combination, are responsible for hernias recurring: patient constitution, such as obesity or constipation: operative technique, such as poor suture placement or a missed indirect sac; and operative complications, such as infection or hematoma. The generally reported incidence of inguinal hernia recurrence at five years is 0% to 20%.

Hernias have both economic and medical importance. They decrease productivity by causing pain, limiting motion, and sometimes causing simple or strangulated intestinal obstruction. The development of a hernia may also be associated with other medical conditions. A continued decrease in the morbidity and mortality of hernia repair is due to improvements in surgical and anesthetic techniques and to the recognition and correction or optimization of coexisting medical conditions, particularly in the elderly. Recognizing and treating factors that produce increased intraabdominal pressure or contribute to infection, before hernia repair, increase the likelihood of a successful repair.

The specific repair used for inguinal hernia varies considerably among surgeons, and each repair has its advocates who have good results with a given technique. In the United States the most commonly used repair for indirect inguinal hernia is the Bassini repair and for direct inguinal hernia are the Bassini, Cooper ligament (McVay), and the Shouldice repairs. While there is considerable variation in the reports of recurrences following the Bassini and Cooper ligament repairs, most surgeons reported the results of the Shouldice repair have consistently reported five-year recurrence rates—0.7% to 1.3%—equal to and often superior to the best results reported for other repairs. The use of a synthetic mesh in primary inguinal hernia repairs has been recommended for the larger and more complex hernias and has a reported recurrence rate of 0% to 4% in several small series.

Outpatient inguinal hernia repair has been shown to be safe, acceptable to patients, and highly cost-effective for most patients. Patients with significant cardiac and respiratory disease, labile hypertension, and insulin-dependent diabetes mellitus or with large hernias are generally best managed as inpatients. The use of 0.5% bupivacaine hydrochloride as a long-acting local anesthetic even when general anesthesia is used appears to be a major factor in patients' acceptance of outpatient hernia surgery. Early ambulation, the avoidance of bladder distension, and adequate pain control are considered the keys to the success of outpatient hernia repair. Recurrence rates of inguinal hernias done using local anesthesia are equal to those done using general anesthesia.

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Symptomatic Carotid Artery Disease

EXTRACRANIAL carotid artery disease is associated with stroke or transient ischemic attacks by three possible mechanisms: emboli, hypoperfusion by flow reduction, and intracerebral propagation of thrombus following occlusion of the internal carotid artery. About 80% of all strokes are thromboembolic in origin. While rare conditions such as fibromuscular disease, aneurysms, and arteritis contribute to this figure, the overwhelming majority of these events are complications of atherosclerosis. A strong correlation between neurologic events and angiographically evident atherosclerotic carotid bifurcation disease has been thoroughly demonstrated. A complex plaque in this region serves as a prime source of cholesterol-fibrin or platelet-aggregate emboli from plaque ulceration. Intraplaque hemorrhage often precedes plaque ulceration. A bifurcation plaque may also cause stenosis of the proximal internal carotid artery; flow limitations will occur if the stenosis is severe (>80% of the area). Symptoms may occur if collateral flow is inadequate. Should total occlusion of the internal carotid occur, propagation of thrombus into the intracranial portion may cause symptoms days later when clot reaches the retinal or middle cerebral vessels.

Hemispheric and retinal symptoms and deficits are classic for carotid disease. Depending on the anatomic situation, however carotid disease may also contribute to basivertebral or global hypoperfusion symptoms. The pattern of symptoms may be important, as recurrent identical hemispheric symptoms are typical of a carotid embolic source. Chronic ocular ischemia may cause various subtle visual symptoms and signs that should arouse a suspicion of a carotid occlusive disease, particularly when not associated with overt retinal disease or hematologic abnormalities. The absence of a cervical bruit in a symptomatic patient should not deter one from looking for carotid occlusive disease.

The possibility of a carotid source of an ischemic event or state should prompt a minimum evaluation with a carotid echo-Doppler scan. In experienced hands, these scans are more than 90% accurate in identifying carotid stenosis and ulceration. They also provide an estimate of plaque "softness," an indicator of increased propensity for embolization. Nonhemispheric symptoms may be further evaluated by physiologic studies such as oculopneumoplethysmography. Isotopic cerebral flow studies also show promise for further clarifying low flow states. Angiography remains the mainstay of the diagnosis of carotid disease and should include intracranial views. Computed tomography (CT) and magnetic resonance imaging can be useful in defining chronic degenerative changes, the presence and location of an infarct, and the age of an infarct by the degree of CT contrast enhancement. This latter study indicates infarct maturation and when operative relief of a tight internal carotid stenosis will be less likely to cause reperfusion injury to the peri-infarct zone.

The treatment of symptomatic carotid disease continues to be controversial. Commonly lost sight of is that the goal of treating carotid disease, medically or surgically, is to prevent stroke—the rare exceptions being where global ischemia causes disabling symptoms. Studies that focus on late survival as an end point and that do not randomly assign symptomatic patients according to the degree of carotid stenosis or ulceration are numerous. Such studies beg the question of whether there is a subset of patients who have experienced transient ischemic attacks or a limited completed stroke and who have a territorially appropriate carotid lesion and can have their chance of future stroke diminished by a particular form of therapy.

The medical treatment of cerebrovascular disease involves the control of hypertension and antiplatelet therapy. Hypertension remains a critical factor in cerebrovascular morbidity. It has been suggested that improved hypertension treatment is responsible for the decrease in the national stroke rate since 1970, but this remains unproved. Antiplatelet therapy has become a mainstay of the treatment of transient ischemic attacks despite most studies showing no stroke-preventive benefit over placebo, only decreased late mortality; 15% to 20% of patients in the "aspirin trials" have gone on to completed stroke within two years.

Scattered reports have appeared of intraluminal balloon angioplasty of carotid bifurcation atherosclerotic stenoses and internal carotid fibromuscular disease. Close monitoring and careful evaluation will be necessary before welcoming or condemning this technique.

Operative intervention for symptomatic carotid disease has been shown by numerous studies to substantially benefit patients with significant stenotic or ulcerative lesions and ipsilateral ischemic events. The stroke rate following a carotid operation would appear to be 1.0% to 1.8% per year for patients with hemispheric symptoms and lower for patients presenting with amaurosis fugax. The comparative stroke rate for patients with transient ischemia treated medically is at least 5% a year. It should be recalled that this figure includes patients with no or minimal demonstrable carotid disease and almost certainly underestimates the natural history of transient ischemic attacks in that cohort with significant carotid disease. Published perioperative stroke and mortality statistics indicate that a carotid operation can be done safely—combined stroke and death rate less than 4%—by experienced surgeons with the proper patient selection. Some series have shown unacceptable results. It is incumbent on each surgeon who does carotid surgery to approach this procedure only with the appropriate indications, to operate with the utmost respect for the potential morbidity, and to constantly review his or her own statistics.

Carotid bifurcation endarterectomy in well-selected cases will result in the relief of hemispheric symptoms with near certainty, a lower recurrent stroke rate for those patients with limited fixed deficits, and the relief of basiverebral and global symptoms in 50% to 70% of cases. The best results in this last category are obtained in patients with classic posterior circulation symptoms, a highly stenotic internal carotid artery, and angiographic posterior circulation compromise. External carotid reconstruction may help selected patients with internal carotid occlusion and definite hemispheric symptoms, particularly if the middle cerebral artery is supplied from that stenotic artery angiographically. Patients with hemispheric transient ischemic attacks and relatively normal carotid arteriograms appear to be at a lower risk for late stroke, particularly if they have had only a single event. Those with multiple events require more careful follow-up with noninvasive examinations.

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Bleeding, Clotting, and the Use of Blood Products in Trauma Care

IMMEDIATELY after serious injury, the ability to limit bleeding from injured tissues largely determines the outcome. For trauma surgeons, there are few situations more harrowing than dealing with a seriously injured patient who has had a breakdown in hemostatic mechanisms. Various approaches designed to prevent such a loss of hemostatic control have been proposed, and some have gained considerable popularity. Whether they are scientifically correct and clinically beneficial is sometimes doubtful.

Several factors are known or suspected to contribute to a breakdown in hemostasis in an injured patient. Preexisting major abnormalities are fortunately rare and usually related to the use of therapeutic drugs. Anticoagulation with vitamin K antagonists is one of the few legitimate indications for the prophylactic use of fresh frozen plasma. Significant hepatocellular insufficiency is another. Hypothermia is one of the avoidable causes of impaired hemostasis and is probably one of the most underestimated in its importance. Hypothermia impairs various steps in the coagulation sequence and seems to have a remarkably strong effect on platelet function in vivo. Hypoperfusion is emerging as perhaps the key causal element in those few patients who have a true systemic breakdown in hemostasis. This concept has been strongly confirmed by almost all the experimental work in this area and has recently been supported by clinical data. The sooner bleeding is stopped and the blood volume restored, the less probability there is of a coagulopathy developing. This effect of sustained and severe hypoperfusion accounts, at least in part, for the association of impaired hemostasis with a massive transfusion.

Massive transfusion deserves special comment because it has become the focus of prophylactic interventions.

Stored blood is variably deficient in some coagulation factors (primarily V and VIII) and is totally devoid of functioning platelets. Therefore, a dilutional or washout effect is anticipated and much feared. Various detailed studies of heavily transfused patients have not shown clinically significant coagulation component deficits, however, except in those with clinically obvious impaired hemostasis in whom the deficits are much greater than can be accounted for by dilution. Factors V and VIII are particularly well maintained because of their rapid rates of synthesis, but these are the two that are depleted in stored blood. Platelets are of a more rational concern, and the platelet count is certainly driven down by dilution in heavily transfused patients. Almost all studies in transfused patients and the pertinent studies in patients undergoing therapeutic plasmapheresis show great difficulty in driving the platelet count below 50×10^9 per liter (50,000 per μl) in patients with intact marrow function. Most important, the hypothesis that giving platelets prophylactically will make a difference in seriously injured, heavily transfused patients has been tested in a randomized prospective trial in Seattle. There was little effect of the prophylactic administration of platelets on the platelet count and no effect on any criterion for bleeding.

The main reason to be selective is that the use of fresh frozen plasma and platelets can transmit serious or lethal infections. The acquired immunodeficiency syndrome has the public's attention at the moment. More important is transfusion-transmitted non-A, non-B hepatitis. It is highly doubtful that the prophylactic administration of fresh frozen plasma and platelets in most transfused injured patients does more good than harm, an opinion recently affirmed by the consensus conferences of the National Institutes of Health.

A recognition of the risk of disease transmission with transfusion has altered the practice of most trauma surgeons. There is now greater emphasis on blood salvaging techniques and autotransfusion. There is general acceptance that lower hematocrits are safe in the average young trauma patient, and the old rule of giving "2 units" of blood automatically when a transfusion is required has been—or should be—abandoned. Many surgeons now question the wisdom of the nonoperative management of solid organ injuries, as patients with these injuries average twice the number of transfusions as those treated surgically.

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Surgical Treatment of Peptic Ulcer Disease

ALTHOUGH the frequency of hospital admissions for peptic ulcer disease was decreasing even before the introduction of H_2-receptor antagonists in the United States in 1977, since 1977 the number of operations for peptic ulcer disease has decreased considerably. In addition to H_2-receptor antagonists, sucralfate (a surface-active agent) has been increasingly used in recent years for the medical management of peptic ulcer disease. In the near future, proton pump blockers will provide nearly complete control of acid secretion. In the face of improved medical management, the nature of the surgical treatment of peptic ulcer disease has changed. Overall, fewer operations are being done than in previous years. A greater percentage of patients are being operated on for the complications of peptic ulcer disease—hemorrhage, perforation, and pyloric obstruction—than for intractable peptic ulcer disease. Those patients who are treated surgically tend to be older and sicker than in previous years, with resultant increased morbidity and mortality.

In addition to the classic operations for peptic ulcer disease—antrectomy with truncal vagotomy and truncal vagotomy with a drainage procedure—the proximal gastric vagotomy (PGV) has been increasingly used for peptic ulcer disease over the past few decades. Although its recurrence rates approaches 15%, the PGV offers less postoperative morbidity (diarrhea and dumping) than the classic operations. For this reason, many consider it the operation of choice for intractable, uncomplicated duodenal ulcer disease. The PGV is also being increasingly used in patients with perforated duodenal ulcers who are considered candidates for a definitive ulcer operation at the time of plication. It has been recommended by some investigators for use in bleeding or obstructing duodenal ulcers and in gastric ulcers but still must be viewed as unproved in these cases. For bleeding duodenal ulcers, oversewing of the bleeding vessel with the truncal vagotomy and pyloroplasty or truncal vagotomy and antrectomy remains the standard. For obstructing duodenal ulcer, a truncal vagotomy and gastrojejunostomy or truncal vagotomy and antrectomy remain the standard operations. For type I gastric ulcers—those to the left of the gastric angulus without associated pyloric or duodenal disease—antrectomy without vagotomy remains the standard operation. For prepyloric ulcers, the PGV has a high recurrence rate, and most surgeons would favor the use of a truncal vagotomy and antrectomy.

Although surgical practice in peptic ulcer disease has changed in recent years, general surgeons must be familiar with all of the operations for peptic ulcer disease and tailor the operation to the given situation of each patient.

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Vascular Endoscopy

ENDOSCOPY of the vascular system has evolved over recent years from an experimental research procedure to a sophisticated diagnostic and therapeutic adjunct for surgical or percutaneous interventions of the peripheral vascular and coronary circulation. Advances in fiber optics and medical electronic imaging systems now allow the production of flexible angioscopy catheters, which incorporate a fluid irrigation channel, in diameters of 2 mm. Ultrafine instruments down to 0.2 mm are also being investigated.

Intraoperative angioscopy is done by introducing the endoscopic catheter through the vessel incision made for a bypass or other procedures. An objective lens transmits the image through a coherent bundle of several thousand quartz fibers to a video camera and magnification system, with a color image projected onto a TV monitor. Flushing of a heparinized saline solution through the irrigation channel clears blood from the field of view and provides a superb three-dimensional view of the vessel interior.

Applications include the verification or further elucidation of ambiguous angiogram abnormalities—including more accurately estimating the severity of stenosis and plaque morphology and differentiating thrombotic occlusion from atherosclerotic processes—the inspection of anastomotic suture lines to exclude technical faults, the identification of venous valves and major tributaries during in situ saphenous vein bypass, monitoring remote intraluminal procedures such as balloon catheter thromboembolectomy or dilatation, and the assessment of the immediate results of newer treatment modalities, especially laser angioplasty and atherectomy. A selective use provides an adjunct to intraoperative arteriography in some cases and allows the omission of radiologic monitoring in others. For example, during balloon-catheter thromboembolectomy, angioscopy provides direct inspection of the vessels—arterial, venous, prosthetic graft, or dialysis shunt—containing thrombus or embolic debris, a visual monitor of the thrombectomy procedure, and an immediate examination of the lumen after instrumentation. Angioscopy also has an increasing role in cardiovascular research, providing unique information on the pathogenesis of vascular diseases and the mechanisms of various forms of angioplasty devices in a controlled environment.

Coronary angioscopic examinations have provided new insights into the nature of coronary ischemic syndromes, particularly with reference to the respective roles of spasm, stenosis, plaque ulceration, and thrombosis. Stable angina pectoris has been seen to be mainly associated with smooth, nonulcerated atheromatous lesions whereas unstable or accelerated angina is more frequently associated with endothelial ulceration, thrombus, and microembolization. Intraoperative inspection of coronary bypass anastomoses has revealed intimal flaps and suture irregularities in a small percentage of cases; these findings may lead to a revision.

Percutaneous vascular endoscopy is also becoming practical, using specially designed vascular cannulae and delivery catheters. These techniques remain investigational and are largely restricted to "downstream" examinations because of the problem of imaging in a flowing bloodstream. Percutaneous systems for coronary endoscopy are being developed.

The limitations of current angioscopy techniques and equipment include a lack of precise steerability, instrument fragility, the potential for complications—intimal trauma, fluid overload, and contamination—and the necessity for experience in the specialized techniques and interpretation of the images obtained. Nevertheless, angioscopy can now be considered an alternative to intraoperative angiography, and it seems inevitable that vascular endoscopy will assume an increasing role in the management of cardiovascular disease.

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Medical Aspects of Domestic Violence

DENNIS GOTTFRIED, M.D.

DURING the past decade there has been an increasing medical and legal recognition of spousal abuse. Wife-battering has probably not become any more common, but rather, is being correctly identified more often. Dr. Evan Stark draws a parallel between woman battering and child abuse.[1] Before research on child abuse in the 1960s, children who were repeatedly abused would be evaluated for rare metabolic disorders. Only after the clinical picture of child abuse was described, were abused children identified as such. Similarly until the last few years, physicians would try to explain away the injuries to women which were the result of battering rather than recognize the true cause of the injuries.

Domestic violence is not a random, anonymous assault. Rather, it involves an assault by an ongoing social partner regardless of gender or marital status. The abuser is male, however, and the victim, female, in 90% of the cases likely to come to medical attention. In addition, the relationship between the victim and the abuser is maintained during, and in spite of, the periods of physical violence. The terms wife-battering and spousal abuse are used loosely in the literature and throughout this article since the couples involved are often unmarried or divorced.

Physical abuse by male social partners is the single most common cause of injury among women, more common than automobile accidents, muggings, and rape combined. Stark and his internist wife, Anne Flitcraft, estimate that over one million women in the United States alone seek help annually for battering. Surveys show that 12% to 20% of all couples at sometime experience intracouple violence and 25% to 30% of all battered women experience frequent violence, often as frequently as weekly. Woman of all marital statuses, ie, married, separated, divorced, or single, are at equal risk for abuse. Only widows are at distinctly lower risk. Spousal abuse is cross cultural. Among 600 couples in the process of divorce, 40% of lower class women and 25% of middle class women reported physical abuse by their spouses.[2]

The magnitude of this problem can be appreciated only when some telling statistics are reviewed. There are over 3 million American women who at sometime have been battered. In Kansas City, for example, 40% of all homicides occurred between spouses, and in 85% of these homicides the police were called to the house before the homicide because of violent behavior.[3] In Cleveland from 1969 to 1980, 40% of all women killed were murdered by their husbands or boyfriends but only 10% of the murdered men were killed by their wives or girlfriends.[4] Since men are murdered more frequently than women, the actual number of men murdered by their mates was approximately equal to the number of women murdered by their male partners. About 26% of female suicide attempts presenting to the hospital were closely associated with an episode of domestic violence.[5] These kinds of statistics illustrate dramatically how pervasive spousal abuse is in our society and how enormous an effect domestic violence has on both the medical establishment and the criminal system.

Family violence, unfortunately, is often passed on from generation to generation. About 45% of the mothers of abused children are themselves abused wives. Furthermore, violence in a woman's family of origin appears to be an indication of a woman's likelihood of being abused; and men who have experienced abuse as children are more likely to be abusive adults. Violence within the family transmits legitimacy to such behavior. Not only are the abusers and the abused united by the thread of violence in their own families as children but assailants and victims share similar traits. They both tend to be dependent, hostile individuals, unable to communicate and with low self-esteem. Often, however, if the abusive relationship is terminated the personality profile of the victim improves remarkably.[5]

Flitcraft and Stark, who were responsible for some of the seminal studies on domestic violence, view wife-battering more in political than in social terms; they regard this type of behavior as a physical attempt by a male to dominate a female.[5] These researchers feel that abusive behavior is becoming more common as a result of women asserting their financial and psychological independence and thereby becoming more threatening to men.

That wife beating occurs, regardless of the cause, is not remarkable. What is remarkable is that such destructive behavior is condoned by anyone! However, in a 1988

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interview sample of representative adult American men and women, 20% of those interviewed approved of husband and wife beating.[6]

Domestic violence manifests itself in a characteristic, predictable manner. Dr. Lenore Walker in her book, *The Battered Woman,* described the cycle of violence that occurs in most battering relationships, a cycle with three phases.[7] The first phase is a tension building phase in which there is increasing strain and uneasiness between the man and the woman. This phase may last days, weeks, or months. Small controversies are amplified as only minor physical or verbal abuse occurs. Tension between the partners mounts in preparation for the second phase, the acute battering incident. This second phase consists of an outburst of violence with the physical abuse of one partner by the other. This phase is relatively short, lasting minutes or hours, and ends with a sudden easing of tensions. The final phase is reconciliation as the repentant assailant begs for, and often receives, forgiveness from the victim for the violent act. The reconciliatory phase then blurs, once again, into a tension building phase as the cycle prepares to repeat itself.

This cycle may be interrupted at any time, but for obvious reasons, the victim is more receptive to intervention by health care workers, social agencies, or counselors after the acute battering incident. Even after punishing beatings, however, most women do not report the abuse either because of embarrassment or fear of even worse physical retaliation.

Gelles studied 41 battered women in a New Hampshire community to assess factors that explain why these woman maintain a battering relationship. He noted four reasons why women remained in abusive relationships:[8]

1. Women who were abused as children were more tolerant of violent relationships and less likely to leave when victimized.
2. The more frequent and the more violent the beatings the more likely would the woman be to leave the abusive relationship. Conversely, the less common and less severe beatings were more likely to be overlooked.
3. Better educated women with better occupational situations were more likely to leave. These women were less commonly confined in an undesirable relationship by financial considerations.
4. When social agencies were readily available and were sensitive to the woman's needs, she was more likely to leave a battering situation.

When the abusive relationship is maintained, medical personnal are often exposed to the acutely battered woman. Family practitioners, psychiatrists, E.R. physicians, and gynecologists often see the injured women, although the fact that these injuries were intentionally inflicted by another person is rarely offered unsolicited. When Stark, Flitcraft, and Frazier reviewed medical records of injured women, their physicians identified only 3% of these women as being abused although 10% of the women had been battered at least once in their medical histories and another 15% had histories which were highly suggestive of abuse.[9] Even though a relatively small percentage of abused women are recognized as being victims of domestic violence, their injuries do come to the attention of physicians. The United States Department of Justice in 1980 estimated that one-third of people reportedly injured by relatives sought medical help and 17% of these were hospitalized.[10] During a sample month at Yale New Haven Hospital, 37 women were admitted with injuries that were the result of beatings.[11] There appeared to be a pattern of injury with the most severe damage being on the head, breasts, and trunk. During pregnancy, beatings often intensified in frequency and severity and were often directed at the pregnant abdomen. Of 290 pregnant women randomly selected in Houston, 24 were abused during pregnancy and 44 before pregnancy. None of these women, in that October 1987 article, were identified as having been abused by her health care provider.[12]

Why do health care providers, eg, doctors, nurses, and nurse practitioners, so rarely recognize the true cause of these victimized women's injuries? When physicians do recognize the problem, why do they usually give pills, like antidepressants or tranquilizers, to the victim rather than trying to intervene and break the violent cycle?[13] The cause of these health care providers' apparent insensitivity may have to do with training. Physicians and nurses have generally not been trained to deal with complex social problems; they feel more comfortable treating a physical problem, like suturing a laceration, than investigating the cause of an injury resulting from violent abuse in an attempt to prevent further injuries. Dobash and Dobash in a paper presented to the World Congress of Sociology in Uppsala, Sweden, expressed the opinion that physicians may actually discourage battered women from discussing the cause of their injuries, preferring instead to dispense medications rather than to talk over the true problems.[14]

During the past decade, however, doctors have been compelled, often against their inclination, to be more concerned about social problems and aware of the help that supportive agencies can provide. With this increased awareness, physicians may be more willing to discuss the possibility of battering with their injured and troubled patients, and more prepared to draw support from ancillary facilities in preventing further episodes of domestic violence.

In the 9 March 1982 issue of *Woman's Day*, an article entitled "New Hope for Battered Wives" presented a Wisconsin survey of 146 battered women. In addition an offer was made to interested readers to request a questionnaire which they could fill out and return to the investigators. The first 854 battered women who sent back the questionnaire, along with the original 146 women, comprised the 1,000 cases in a large national survey on battering. In addition, many more women responded by filling out the original questionnaire but were not included in the survey. Other women sent long narrative letters with information that could not be utilized for the study. The 1,000 women who provided the information used in the study were primarily upper middle class (75% graduated high school; 61% owned their own home), predominantly white (93%), and were married to the men with whom they lived (91%). These characteristics probably reflect the general readership of *Women's Day*. The findings were revealing: Forty-one percent of the women said that weapons had been used against them and in 70% of the families with children, the children had also been beaten. Forty-eight percent of the women said that they were assaulted during their pregnancies, and 7% of them suffered miscarriages as a result of the beatings. The medical and social implication of these numbers is staggering.

The women often sought medical help as a way out of their dreadful situations. In the survey, 39% of the women at sometime approached medical professionals for help, but only 8% felt that as a result of this attempt, the violence actually diminished. Clergymen and police were also unsuccessful in assisting the surveyed women to improve their domestic situation. The most helpful resources in decreasing the violence were social service agencies, lawyers, and shelters. Overall, the police were the group whose services were engaged most frequently by the victims in spite of the ineffectiveness of this approach. One would hope that with recent legislation in Connecticut and other states demanding specific action by the police in cases of domestic violence, the police will be more effective in preventing further violence.

The laws that deal with domestic violence have primarily been enacted, piece by piece, over the last 10 years. The United States House of Representatives increased public awareness of the problem by holding open hearings on battering in the late 1970s.[15] Subsequently, legislation was passed to support shelter-oriented education and to coordinate the work of providers of these shelters.[16] Since then, further legislation on a state-by-state and federal level has improved funding for shelters, transitional housing for battered women and their children, support groups, and educational programs. The bills to combat domestic violence have passed as the result of such diverse political support as family-oriented, conservative church groups and liberal, feminist groups.

In October 1986 the Family Violence Prevention and Response Act came into effect in Connecticut.[17] This bill was broader in scope than previous domestic violence bills which only dealt with married couples. The new bill defined domestic violence to include abuse by any family member, household member, former spouse, or parent of the victim's child. The bill also outlined courses of action for police when summoned to a domestic violence incident. It described possible courses of action for the courts, provided for prompt arraignment of the accused, and for educational programs for first time offenders.

The current law now requires reporting of all episodes of family violence by the police, by the courts, and by medical providers. Whenever an individual is treated for injuries that are the direct result of family violence or in which there is "reasonable cause" to suspect domestic violence, a report must be submitted to the Connecticut Department of Public Safety. Failure to comply with proper reporting may result in a fine of up to $500.

The Department of Public Safety publishes a yearly report. Their 1988 report provided statistics on over 1,400 episodes. Virtually all the reports were submitted by hospitals and only four reports by private practitioners. This undoubtedly represents tremendous underreporting by practitioners statewide.

We, the members of the medical community, must be aware of the widespread problem of battering and how frequently we are called upon to care for the victims. We must understand and be sensitive to the needs of battered women and never fail to ask questions, always in a nonthreatening manner, to obtain information which may not freely be offered. We must be aware of available social agencies, support groups, and shelters, and offer specific social and legal options to the victims. We should be familiar with the laws dealing with domestic violence and understand our responsibilities under those laws. If our advice is not immediately heeded, we must nevertheless assure the women that we will be available for help in the future if the need should arise. It is only by being aware of the prevalence and nature of domestic violence, by being sensitive to the needs of the victims, and by being knowledgeable of their options, and ours, that we can effectively combat this tragic social, legal, and medical problem.

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Medical Applications of Fetal Tissue Transplantation

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Fetal tissue transplantation has been attempted for a limited number of clinical disorders, including Parkinson's disease, diabetes, immunodeficiency disorders, and several metabolic disorders. Fetal tissue has intrinsic properties—ability to differentiate into multiple cell types, growth and proliferative ability, growth factor production, and reduced antigenicity—that make it attractive for transplantation research. At this time the results from fetal tissue grafts for Parkinson's disease and diabetes have not demonstrated significant long-term clinical benefit to patients with these disorders. Further research will be necessary to determine the potential value of fetal tissue transplantation. For these clinical investigations to proceed, specific ethical guidelines are needed to ensure that fetal tissue derived from elective abortions is used in a morally acceptable manner. These guidelines should separate, to the greatest extent possible, the decision by a woman to have an abortion from her consent to donate the postmortem tissue for transplantation purposes. Such ethical guidelines are offered in this report.

THE prospect of therapeutically effective fetal tissue transplants for disorders such as diabetes and Parkinson's disease has raised new questions in the ethical discussion on fetal research.[1-3] These questions are distinct from those addressed in the 1970s that focused on invasive procedures performed by some researchers on living, viable fetuses. They are also separate from the questions that were raised by the development of new techniques for prenatal diagnosis, such as fetoscopy and chorionic villus sampling. Although the use of transplanted tissue from a fetus after spontaneous or induced abortion appears to be analogous to the use of cadaver tissue and organs, the moral issue for many is the possibility that the decision to have an abortion will become coupled with the decision to donate fetal tissue for transplantation procedures.

The utilization of human fetal tissue for transplantations is, for the most part, based on research data derived from experimental animal models. At this time, the number of such transplantations performed has been relatively small, but the various applications are promising avenues of clinical investigation for certain disorders. The purpose of this report is to (1) review the data on fetal tissue transplantation in animals and in specific clinical disorders, (2) review the legal and ethical issues involved in fetal tissue transplantation, and (3) provide ethical guidelines for the use of fetal tissue for transplantation.

Fetal Tissue Transplantation

Human fetal tissue research has led to the development of a number of important research and medical advances. Embryonic human tissues have been the source of scientifically valuable cell lines in culture that have been important research models for studying cell-to-cell interactions and gene expression. The research and development of the polio vaccine was accomplished with the use of human fetal kidney cells. Currently, human fetal cells are being used to study the mechanism of viral infections and to diagnose viral infections[4-6] and inherited diseases.

Fetal cells have four basic properties that make them clinically useful for grafting or transplantation applications: (1) the ability to grow and proliferate, (2) the ability to undergo cell and tissue differentiation (intrinsic plasticity), (3) the ability to produce growth factors, and (4) reduced antigenicity compared with adult tissue (although this property does not always apply).[7(ppD28-D31)]

The plasticity of transplanted fetal tissue has been demonstrated in numerous animal studies. Embryonic wing tissue from a chicken retains the functional capacity to differentiate into a leg when transplanted into the appropriate limb bud region of the developing chick.[7(ppD28-D31)] In animal experiments in which the recipient is a fully differentiated adult, intracerebral implants of fetal neurons can establish extensive synaptic connection and under certain conditions can become partially integrated into the circuitry of adjacent neural tissue.[8] The ability of fetal cells to grow and proliferate in vivo following transplantation increases the success rate of functional engraftment. An important example of this property is the recent experiment in which human lymphatic tissue was transplanted into immunodeficient mice.[9] This was accomplished using a strain of mice with severe combined immunodeficiency (SCID) as the recip-

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This report is not intended to be construed or to serve as a standard of medical care. Standards of medical care are determined on the basis of all of the facts and circumstances involved in an individual case and are subject to change as scientific knowledge and technology advance and patterns of practice evolve. This report reflects the views of scientific literature as of June 1989.

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ient and human fetal liver (containing both T- and B-cell lymphoid progenitor cells), fetal thymus, and fetal lymph node cells as the donor tissues. Following transplantation, the human fetal tissues established themselves in the mice with SCID and developed further to produce a functioning human immune system. The SCID-hu mouse with its human immune system may become a valuable model in studying the acquired immunodeficiency syndrome.

Fetal cells have the additional ability to produce trophic substances that not only can increase their own ability to survive and grow but also can promote regeneration of nearby damaged tissue. Angiogenic factors from fetal tissue can promote blood vessel formation, and nerve growth factors released by fetal neuroblasts can assist in neural tissue regeneration.[7(ppD28-D31),8]

A theoretically important factor in successful fetal tissue engraftment is the ability of the transplanted cells to escape the immune surveillance of the host, but this is not true for all fetal tissues. In general, fetal neural cells have been shown to be less antigenic than adult differentiated tissue.[10] Fetal neural tissue transplants, for example, often do not elicit a significant immune response in recipient rodent and nonhuman primate models.[7(ppD127-D131),8] However, animal studies comparing the immunogenicity of fetal pancreas with adult pancreatic islet cells show that fetal tissue can be as immunogenic, if not more, so than adult tissue.[11] Fetal liver cells also have been demonstrated to be antigenic. Successful transplantation of canine fetal liver from donors mismatched for histocompatibility (HLA) antigens required immunosuppressive therapy before and after transplantation in recipient dogs.

Human fetal tissue transplantations have been attempted in a number of human disorders, including Parkinson's disease, diabetes, severe combined immunodeficiency DiGeorge's syndrome, aplastic anemia, leukemia, thalassemia, Fabry's disease, and Gaucher's disease. With the immunodeficiency disorders, restoration of immune function and long-term patient survival have been achieved. The following sections review the major research areas for the clinical application of human fetal transplants.

Immunodeficiency Disorders

Human fetal liver has been used in attempts to reconstitute immune function in SCID, while fetal thymus transplants have been somewhat effective in DiGeorge's syndrome. The liver is an important site of hematopoiesis during fetal development and contains abundant hematopoietic progenitor cells. Immunologically, the fetal liver differs from adult bone marrow in that the former contains relatively few immunocompetent T lymphocytes. Since graft-vs-host disease (GvHD) is a major barrier to the transplantation of allogeneic hematopoietic cells[12] and since immunocompetent T cells present in transplanted bone marrow are associated with GvHD, the fetal liver has been considered a possible alternative source of hematopoietic tissue.[13-15] Animal experiments have shown that transplanted fetal liver cells are capable of restoring hematopoiesis and immunity in lethally irradiated rodents.[16] Even when the fetal tissue donor and recipient are mismatched for histocompatibility antigens, the resulting GvHD was mild and delayed compared with what occurred following bone marrow transplantations (BMTs). Experiments in dogs have demonstrated that HLA-mismatched fetal liver grafts can restore T- and B-cell function in irradiated dogs that also were receiving cyclosporine for immunosuppression.[17]

Clinically, fetal liver transplantations have been attempted in patients with SCID.[16] This relatively heterogeneous condition often leads to death from opportunistic infections before the age of 1 year. Bone marrow transplantation has resulted in long-term survival in patients with SCID; the success rate is as high as 80% when the HLA type of the donor is identical to that of the recipient. In the absence of an HLA-compatible donor, patients can be treated successfully with a haploidentical BMT. A haploidentical BMT requires the in vitro removal of T lymphocytes capable of inducing or enhancing a GvHD.

Fetal liver transplantation represents a third approach to immune reconstitution in SCID, but it currently is of less clinical significance than haploidentical BMT. Sustained engraftment of lymphoid progenitor cells from fetal liver has been achieved in a number of patients. Complete immunologic reconstitution, including normal T-cell function, has been demonstrated despite HLA mismatch between donor and recipient cells.[16] Fetal liver grafts may be optimal when used in conjunction with fetal thymus tissue from the same donor, but this has not been established conclusively.[16] Clinical experience indicates that the optimal age of the fetal liver for transplantation is 8 to 13 weeks; the risk of GvHD is higher in livers older than 20 weeks.[16] The relative efficacy of fetal liver compared with HLA haploidentical T-cell-depleted BMT has not been studied.

Fetal thymus transplants have been successfully used in the treatment of DiGeorge's syndrome, a rare congenital cellular immunodeficiency associated with the absence of the thymus and parathyroid glands. Clinical manifestations of the disease are immune deficiency with increased susceptibility to infections as well as hypoparathyroidism, hypocalcemia, and congenital heart defects.[18,19]

Hematologic Disorders

More than 100 patients with aplastic anemia have undergone treatment with fetal liver transplants. However, because these patients still have functioning immune systems that react against HLA-mismatched fetal liver tissues, transplantation cannot be successful in most instances; engraftment has been low (3%), as documented by cytogenetic analysis. Therefore, the true efficacy of fetal liver transplantation for aplastic anemia cannot be evaluated until transplantations have been attempted following immunosuppressive therapy.[20]

Fetal liver transplantations have been attempted in 39 patients with acute myelogenous leukemia. In treating acute myelogenous leukemia, human fetal liver transplantations could result in successful engraftment, with reconstitution of hematopoietic function and/or expedited recovery of the patient's own hematologic system. However, transplant failure is common. Antigenic barriers appear to be too great for successful engraftment without prior immunosuppression with drugs and radiation.[20] As with aplastic anemia, human fetal liver transplanation for acute myleogenous leukemia has not been conducted under immunosuppressive conditions that would permit evaluation of engraftment success. Part of the problem in determining the efficacy of fetal liver cells in accelerating hematopoietic tissue recovery is the dependency of this procedure on the initial effectiveness of chemotherapy against acute myelogenous leukemia. Because of the variable response to chemotherapy, further evaluation of any additional improvement resulting from the fetal liver infusion will require controlled clinical trials.

Diabetes

The potential to cure experimentally induced diabetes mellitus in animals through the syngeneic transplantation of fetal pancreatic tissue has been documented.[21] That human fetal pancreatic tissue transplantations could cure patients has been proposed as a result of these preclinical studies. However, the application of fetal cell transplantations to diabetes is complicated by inadequate engraftment success in immunosuppressed recipients as well as insufficient quantities of viable fetal tissue and storage arrangements for such tissue.

Transplantation of cultured fetal pancreas cells has been tried in more than 100 insulin-dependent patients.[22] So far there have been no successful grafts as judged by complete long-term withdrawal of insulin therapy, but there has been one report of survival of transplanted fetal pancreas tissue for 13 weeks.[22] Reduced insulin requirements and increased C-peptide production also have been reported, but the effects have been transient.[23] Although the current attempts have been relatively unsuccessful, the human fetal pancreas does exhibit the necessary plasticity and proliferative properties outlined earlier. Human fetal cells transplanted into nude mice undergo selective differentiation into mature pancreatic tissue containing vascularized endocrine tissue, ducts, and fibrous tissue. Islet cells in these transplants also grew, leading to maturation of the insulin response to glucose and reversal of the hyperglycemia in the streptozocin-induced diabetic nude mouse.[22]

With these encouraging results in animal studies together with advances in the cryopreservation of the fetal pancreas tissue,[24] research on fetal cell transplantation for diabetes is worth pursuing. An important challenge for this area of research is to understand the inability of the transplant to correct diabetes completely in patients. Engraftment problems may be due to residual immature lymphocytes that are strongly immunogenic. Purification of fetal pancreatic cells to separate out these lymphocytes is one potential approach.[25]

Other Metabolic and Genetic Disorders

Fetal liver transplantations have been tried in a small number of patients with thalassemia, Fabry's disease, and Gaucher's disease. Treatment by this approach is preliminary, but some beneficial clinical results have been reported.[26] Fetal tissue transplantation experiments for these and other inherited disorders have been suggested as forerunners to the use of genetically engineered cells.

Parkinson's Disease

Fetal nerve-cell grafts have been carried out successfully in animal models of neurodegenerative disease. The technique of neural grafting was initially used in neurobiology to study nerve-cell development and regeneration, primarily in invertebrate models.[8] The consistent transplant-induced improvements in motor, sensory, cognitive, and endocrine functions in animal models prompted the rationale that similar transplantations of human fetal neurons could improve the clinical symptoms of neurologic disorders such as Parkinson's disease.[27] New approaches to the treatment of this disorder are critical, since the response to currently available drug therapy is reduced as the disease state progresses.

The mechanism by which intracerebral implants exert their effect has been studied in animal models. Fetal neurons, especially monoamine neurons, express a high degree of neural plasticity and regenerative capacity. These neurons establish extensive efferent synaptic connections with previously denervated or neuron-depleted host brain regions.[8] Thus, the grafts partially restore some form of neural circuitry through the development of dendritic processes from the transplant to the host neurons. In the nigrostriatal dopaminergic systems, grafts of fetal nigral or striatal neurons have restored synaptic transmission and have led to partial reconstruction of functional neural transmitter specific patterns of innervation.[8,27]

Several rodent models have been used to study the potential effectiveness of fetal nerve-cell transplants to restore or improve neurologic function. Although the rodent models have provided important information on the potential application of fetal neural tissue to Parkinson's disease,[27] they do not completely model the complex symptomatology observed in the human disease. The etiology of Parkinson's disease in the human patient is unknown. One hypothesis, encompassing multiple causes, suggests that the disease results from a genetic susceptibility coupled with a long-term exposure to environmental toxins. The metabolized toxin causes damage to a select population of cells, and subsequent cell death results from an autoimmune response directed against the damaged cell membranes. Specifically, the unidentified environmental toxin is thought to become metabolized to a highly reactive form that concentrates in the substantia nigra and induces extensive cell damage. The same cellular selectivity and damage found in patients with Parkinson's disease can be induced in primates with 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine

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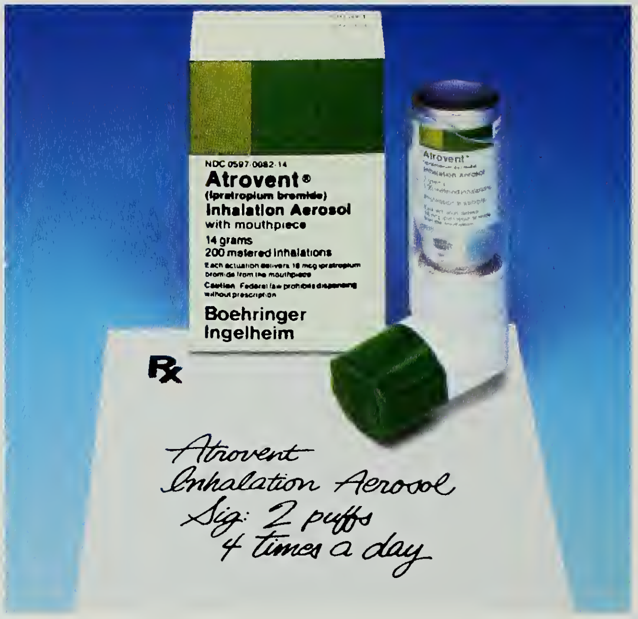

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PRECAUTIONS General Atrovent® (ipratropium bromide) should be used with caution in patients with narrow-angle glaucoma, prostatic hypertrophy or bladder-neck obstruction.

Information for Patients Patients should be advised that temporary blurring of vision may result if the aerosol is sprayed into the eyes.

Patients should be reminded that Atrovent is not intended for occasional use, but rather, in order to be maximally effective, must be used consistently as prescribed throughout the course of therapy.

Drug Interactions Atrovent has been used concomitantly with other drugs, including sympathomimetic bronchodilators, methylxanthines, steroids and cromolyn sodium, commonly used in the treatment of chronic obstructive pulmonary disease, without adverse drug reactions. There are no formal studies fully evaluating the interactive effects of Atrovent and these drugs with respect to effectiveness.

Carcinogenesis, Mutagenesis, Impairment of Fertility Two-year oral carcinogenicity studies in rats and mice have revealed no carcinogenic potential at doses up to 1250 times the maximum recommended human daily dose for Atrovent. Results of various mutagenicity studies were negative.

Fertility of male or female rats at oral doses up to approximately 10,000 times the maximum recommended human daily dose was unaffected by Atrovent administration. At doses above 18,000 times the maximum recommended human daily dose, increased resorption and decreased conception rates were observed.

Pregnancy *TERATOGENIC EFFECTS Pregnancy Category B.* Oral reproduction studies performed in mice, rats and rabbits (at doses approximately 2,000, 200,000 and 26,000 times the maximum recommended human daily dose, respectively) and inhalation reproduction studies in rats and rabbits (at doses approximately 312 and 375 times the maximum recommended human daily dose, respectively) have demonstrated no evidence of teratogenic effects as a result of Atrovent. However, no adequate or well-controlled studies have been conducted in pregnant women. Because animal reproduction studies are not always predictive of human response, Atrovent should be used during pregnancy only if clearly needed.

Nursing Mothers It is not known whether Atrovent is excreted in human milk. Although lipid-insoluble quaternary bases pass into breast milk, it is unlikely that Atrovent would reach the infant to an important extent, especially when taken by aerosol. However, because many drugs are excreted in human milk, caution should be exercised when Atrovent is administered to a nursing woman.

Pediatric Use Safety and effectiveness in children below the age of 12 have not been established.

ADVERSE REACTIONS Adverse reaction information concerning Atrovent® (ipratropium bromide) is derived from 90-day controlled clinical trials (N = 254), other controlled clinical trials using recommended doses of Atrovent (N = 377) and an uncontrolled study (N = 1924). Additional information is derived from the foreign postmarketing experience and the published literature.

Adverse reactions occurring in greater than one percent of patients in the 90-day controlled clinical trials were as follows (ipratropium bromide N = 254; metaproterenol sulfate N = 249): *Cardiovascular:* palpitations — 1.8% *v* 1.6%. *Central Nervous System:* nervousness — 3.1% *v* 6.8%; dizziness — 2.4% *v* 2.8%; headache — 2.4% *v* 2.0%. *Dermatological:* rash — 1.2% *v* 0.4%. *Gastrointestinal:* nausea — 2.8% *v* 1.2%; gastrointestinal distress — 2.4% *v* 2.8%; vomiting — 0% *v* 1.2%. *Musculoskeletal:* tremor — 0% *v* 2.4%. *Ophthalmological:* blurred vision — 1.2% *v* 0.8%. *Oro-Otolaryngeal:* dry mouth — 2.4% *v* 0.8%; irritation from aerosol — 1.6% *v* 1.6%. *Respiratory:* cough — 5.9% *v* 1.2%; exacerbation of symptoms — 2.4% *v* 3.6%.

Additional adverse reactions reported in less than one percent of the patients considered possibly due to Atrovent® (ipratropium bromide) include urinary difficulty, fatigue, insomnia and hoarseness.

The large uncontrolled, open-label study included seriously ill patients. About 7% of patients treated discontinued the program because of adverse events.

Of the 2301 patients treated in the large uncontrolled study and in clinical trials other than the 90-day studies, the most common adverse reactions reported were: dryness of the oropharynx, about 5 in 100; cough, exacerbation of symptoms and irritation from aerosol, each about 3 in 100; headache, about 2 in 100; nausea, dizziness, blurred vision/difficulty in accommodation, and drying of secretions, each about 1 in 100. Less frequently reported adverse reactions that were possibly due to Atrovent include tachycardia, paresthesias, drowsiness, coordination difficulty, itching, hives, flushing, alopecia, constipation, tremor, mucosal ulcers.

Cases of precipitation or worsening of narrow-angle glaucoma, acute eye pain and hypotension have been reported.

A case of giant urticaria with positive rechallenge has been reported from the foreign marketing experience (see CONTRAINDICATIONS).

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(MPTP). The MPTP nonhuman primate model is a closer approximation of the human disease than the rodent model. The MPTP becomes a selective neurotoxin following activation by monoamine oxidase B. Monoamine oxidase B oxidizes MPTP to the free radical 1-methyl-4-phenylpyridine, which becomes selectively concentrated in dopamine-producing neurons. Accumulation of 1-methyl-4-phenylpyridine leads to cell death and subsequent behavioral and anatomical alterations in treated monkeys that are similar to the pathologic conditions and symptoms seen in the human condition. The MPTP-treated African green monkeys show a specific loss of nigrostriatal dopamine neurons and a relatively rapid symptomatic progression from a generalized slowing of movement with slight tremors to akinesia, rigidity, difficulty in initiating movements, and resting tremor. Therefore, these monkeys are an excellent model for assessing the effect of fetal neural grafting. In a study using the MPTP model,[28] three monkeys with neurotoxin-induced parkinsonism showed significant improvement in symptoms over a 10-week period after receiving grafts of fetal substantia nigra into the striatum. After 10 weeks the monkeys were killed; immunohistochemial analysis revealed the presence of well-delineated grafts of dopaminergic neurons and fiber systems. In this study, immunologic rejection of the fetal neural graft was not a problem.

The primate model suggests that fetal neurol grafts will be an effective treatment of Parkinson's disease in human patients. Fetal implants for Parkinson's disease have been performed in the People's Republic of China, Mexico, Swedan, Canada, Great Britain, Cuba, and the United States.[29] Little information is available on the outcome of the Chinese and Cuban transplantations. In the Mexican trial, the two patients receiving human fetal nerve transplants appeared to improve progressively following surgery; however, no reliable signs of symptom alleviation could be demonstrated.[30] Similarly, the degree of long-term improvement in motor function in the American, Canadian, English, and Swedish transplant patients has not yet been ascertained.

The inconclusive results of the clinical trials together with the complexities of human fetal neural grafting suggest that caution must be exercised in promoting these types of transplantations.

Future Directions

Alternatives to the use of human fetal tissues are available for immunodeficient disorders (eg, BMT) and diabetes (eg, adult islet-cell and whole pancreas transplantations). In neural and other transplantations, the use of peripheral neural and paraneural tissues and cell culture may offer alternatives to fetal tissue. Paraneural cells (eg, adrenal medulla cells) may be modified into neural-like cells under the influence of nerve growth factor. Adrenal medullary cells from rats, monkeys, and humans develop processes and become neuronlike when treated with growth hormone.[22] Xenografting represents another possible approach. Advances in immunosuppressive therapy may limit the rejection of nonhuman fetal substantia nigral implants in patients with Parkinson's disease. An additional research area is modification of human neuroblastoma so that it becomes quiescent mitotically and expresses a specific neural transmitter to replace, for example, the dopamine that is lost in Parkinson's disease. Finally, it may be possible in the future to genetically engineer cell lines capable of both proliferating and producing a specific neurotransmitter.

Many of these manipulative procedures, particularly the development of genetically engineered cells, will not be accomplished in the near future. In the meantime, human fetal tissue transplantation research may eventually lead to some beneficial therapeutic approaches to patients with Parkinson's disease and those suffering from other disorders. For example, the continued efforts to purify specific fetal cell populations may improve the application of fetal cell transplantation for immunodeficient disorders and diabetes. The results of future transplantation studies will be needed to further assess this procedure.

Legal and Ethical Implications

The transplantation of human fetal neural or pancreatic tissue and, to a lesser extent, fetal lymphoid cells is subject to federal regulations protecting human subjects (ie, recipients of the procedure). Approval of the transplantation protocol requires review and approval by an institutional review board to ensure that the risks to the patient are minimized. The acquisition of tissue from an aborted fetus is not governed by federal regulations. Instead, federal regulations leave the disposition of fetal remains to state and local regulation: "Activities involving the dead fetus, macerated fetal material, or cell, tissue, or organs excised from a dead fetus shall be conducted only in accordance with any applicable state or local laws regarding such activity."[31]

The acquisition and use of tissue obtained from dead fetuses is governed by the Uniform Anatomical Gift Act, which has been adopted by all states and the District of Columbia. The Uniform Anatomical Gift Act provides the primary legal standard for fetal tissue use, permitting fetal tissue to be donated for research purposes with the consent of either parent and if there is no objection from the other parent.[32]

Several states have restrictive statutes governing the donation of fetal tissue for research. Massachusetts and Michigan have laws that prohibit abortion if it is conditional on the use of the fetal tissue for research. Arizona law specifically prohibits the postmortem use of fetal remains for "any medical experimentation" if the tissue is derived from an induced abortion. Other states (eg, Ohio, Oklahoma, and Indiana) have statutes that restrict research on aborted fetal remains.

The demand for fetal tissue transplantation for neural or pancreatic cell engraftments may be expected to increase if further clinical studies conclusively show that these procedures provide long-term reversal of neural or endocrine deficits. The ethical issues that fetal cell transplantation has raised are distinct from ethical points addressed during the previous discussions of fetal tissue research.

Prominent among the currently identified ethical concerns is the potential for fetal transplantations to influence a woman's decision to have an abortion.[1-3,33] These concerns are based at least in part on the possibility that some women may wish to become pregnant for the sole purpose of aborting the fetus and either donating the tissue to a relative or selling the tissue for financial gain. Others suggest that a woman who is ambivalent about a decision to have an abortion might be swayed by arguments about the good that could be achieved if she opts to terminate the pregnancy. These concerns demand the prohibition of (1) the donation of fetal tissue to designated recipients, (2) the sale of such tissue, and (3) the request for consent to use the tissue for transplantation before a final decision regarding abortion has been made.

The abortion process may also be influenced inappropriately by the physician. Consequently, measures must be taken to ensure that decisions to donate fetal tissue for transplantation do not affect either the techniques used to induce the abortion or the timing of the procedure itself with respect to the gestational age of the fetus. Also, to avoid conflicts of interest, physicians and other health care personnel involved in performing abortions should not receive any direct benefit from the use of tissues derived from the aborted fetus for research or transplantation. The retrieval and preservation of usable tissue cannot become the primary focus of abortion. Therefore, members of the transplantation team should not influence or participate in the abortion process.

There is potential commercial gain for those involved in the retrieval, storage, testing, preparation, and delivery of fetal tissues. Providing fetal tissue by nonprofit mechanisms designed to cover costs only would reduce the possibility of direct or indirect influence on a woman to acquire her consent for donation of the aborted fetal remains.

In summary, the use of fetal tissues for transplantation purposes is ethically permissible when (1) the guidelines of the Council on Ethical and Judicial Affairs on clinical investigation and organ transplantation are followed as they pertain to the recipient of the fetal tissue transplant (See the Appendix), (2) fetal tissue is not provided in exchange for financial renumeration above what is necessary to cover reasonable expenses, (3) the recipient of the tissue is not designated by the donor, (4) a final decision regarding abortion is made before discussion of the transplantation use of fetal tissue is initiated, (5) decisions regarding the technique used to induce abortion as well as the timing of the abortion in relation to the gestational age of the fetus are based on concern for the safety of the pregnant woman, (6) health care personnel involved in the termination of a particular pregnancy do not participate in or receive any benefit from the transplantation of tissue from the abortus of the same pregnancy, and (7) informed consent on behalf of both the donor and the recipient is obtained in accordance with applicable law.

Conclusion

At this time, fetal neural grafting is a promising area of clinical investigation that should receive federal funding. The current transplantation experiments may be viewed as the initial step in determining the effectiveness of this approach for the treatment of Parkinson's disease, other neurodegenerative conditions, and diabetes. Parkinson's disease remains the most attractive disorder for this procedure because of the relatively localized region of deficit compared with the more widespread degeneration observed in such neurologic disorders as Alzheimer's disease.

The donation of fetal tissue for transplantation from spontaneous or induced abortions is governed legally by the Uniform Anatomical Gift Act. A number of states prohibit experiments on fetal remains from elected abortions, but such statutes may not apply if fetal cell transplantation becomes routine (ie, nonresearch in nature). The principal ethical concern in the use of human fetal tissue transplants is the degree to which the decision to have an abortion can be separated from the decision to donate the postmortem tissue. Safeguards to reduce any motivation, reason, or incentive by the woman to have an abortion can be developed to allow the benefits of this procedure to be made available to those who are in need of improved therapies.

Appendix

Current Opinions of the Council on Ethical and Judical Affairs of the American Medical Association—1990

Clinical Investigation: Replacement of Vital Human Organs (2.07).—The following are guidelines, suggested by the Council, in conducting experimental or clinical investigation, such as with mechanical devices or animal organs, for the replacement of human organs that are no longer functional.

1. Experimental or clincial investigations should be conducted as part of a systematic program competently designed, under accepted standards of scientific research, to produce data that are scientifically valid and significant.

2. The physicians conducting clinical investigation should demonstrate the same concern and caution for the welfare, safety, and comfort of the persons involved as is required of physicians who are furnishing medical care to patients independent of any clinical investigation.

3. Voluntary written consent must be obtained from the patient, or from his or her legally authorized representative if the patient lacks capacity to consent, following *(a)* disclosure that the physician(s) intend to use an investigational or experimental procedure, *(b)* a reasonable explanation of the nature of the procedure to be used, risk to be expected, and possible therapeutic benefits, *(c)* an offer to answer any inquiries concerning the

procedure, and *(d)* a disclosure of alternative procedures, if any, that may be available. Physicians should be completely objective in discussing the details of the procedure to be performed, the pain and discomfort that may be anticipated, known risks and possible hazards, the quality of life to be expected, and particularly the alternatives. Especially, physicians should not use persuasion to obtain consents that otherwise might not be forthcoming, nor should expectations be encouraged beyond those which the circumstances reasonably and realistically justify.

4. In clinical investigation primarily for the accumulation of scientific knowledge, adequate safeguards should be provided for the welfare, safety, and comfort of the patient. The medical profession recognizes as a fundamental social policy that the advancement of scientific knowledge must always be secondary to primary concern for the individual. The physician must never deny the patient the best possible therapeutic modality in favor of an experimental treatment that is less likely to succeed.

5. With the approval of the patient or the patient's lawful representative, physicians should cooperate with the press and media to ensure the medical news concerning the progress of clinical investigation or the patient's condition is available more promptly and more accurately than would be possible without their assistance. On the other hand, the Council does not approve of practices designed to create fanfare, sensationalism to attract media attention, and unwarranted expressions of optimism because of short-term progress, even though longer-range prognosis is known from the beginning to be precarious. With the approval of the patient or the patient's family, the Council, however, encourages the objective disclosure to the press and media of pertinent information. The situation should not be used for the commercial ends of participating physicians or the institutions involved.

The Council has not evaluated nor does it have sufficient information on which to base an evaluation as to the extent to which cases involving the use of animal organs and mechanical hearts conform to the above guidelines. These guidelines are provided to the public, the medical profession, and the scientific community in the belief that they may find them helpful in making their own independent judgments.

Organ Transplantation Guidelines (2.15).—The following statement is offered for guidance of physicians as they seek to maintain the highest level of ethical conduct in the transplanting of human organs.

1. In all professional relationships between a physician and his or her patient, the physician's primary concern must be the health of the patient. The physician owes the patient his or her primary allegiance. The concern and allegiance must be preserved in all medical procedures, including those that involve the transplantation of an organ from one person to another where both donor and recipient are patients. Care must, therefore, be taken to protect the rights of both the donor and the recipient, and no physician may assume a responsibility in organ transplantation unless the rights of both donor and recipient are equally protected.

2. A prospective organ transplant offers no justification for a relaxation of the usual standard of medical care. The physician should provide the patient, who may be a prospective organ donor, with the care usually given others being treated for a similar injury or disease.

3. When a vital, single organ is to be transplanted, the death of the donor shall have been determined by at least one physician other than the recipient's physician. Death shall be determined by the clinical judgment of the physician. In making this determination, the ethical physician will use currently accepted and available scientific tests.

4. Full discussion of the proposed procedure with the donor and the recipient or their responsible relatives or representatives is mandatory. The physician should be objective in discussing the procedure, in disclosing known risks and possible hazards, and in advising the alternative procedures available. The physician should not encourage expectations beyond those that the circumstances justify. The physician's interest in advancing scientific knowledge must always be secondary to his or her primary concern for the patient.

5. Transplant procedures of body organs should be undertaken (*a*) only by physicians who possess special medical knowledge and technical competence developed through special training, study, and laboratory experience and practice, and (*b*) in medical institutions with facilities adequate to protect the health and well-being of the parties to the procedure.

6. Transplantation of body organs should be undertaken only after careful evaluation of the availability and effectiveness of other possible therapy.

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A Few Thoughts for New Physicians

Presented to University of Connecticut School of Medicine Class of 1988

SHARON DIAMEN, M.D.

WELL you've finally made it. Through biochemistry and pathobiology and the Boards Parts I and II. Through medicine and OB and surgery and interviews and Match. You've found an apartment, you're recently married, and tomorrow is the BIG DAY. Your parents will be in the audience lighting up the night with their pride and the graduation parties...memorable! You'll get packed, move, get settled, and then the sense of dread will descend. "Oh my God. I'm going to be an intern!" You went to a fine medical school, did well in your clerkships, aced the boards, and of course they wouldn't let you graduate if they didn't think you had your act together. But you can't shake the feeling that somehow you're not ready for this. "What will I do if I'm on call the first night?" "What will I do if someone codes ... or bleeds ... or strokes ... or seizes?"

Internship is the point where medical legends begin. Whether you're at MGH or Reading Hospital, whether internist, psychiatrist, or surgeon, you'll share a common experience with every physician. We certainly all love to talk about it, especially after we've finished it. And the farther from it we are the more affection with which we remember it. So what are you really in for — a chamber of horrors or intellectual bliss? Well, probably neither. It will be both better and worse than you expect. And if you can prepare yourself with enough good humor and sense of perspective, it will be the adventure of your life.

After the excitement of moving and getting settled in your new home wears off, you'll feel the compulsion to study. After all that's how you've dealt with every professional crisis in your past. RESIST! Go to the beach. Read trashy novels. Do only fun things. Nonmedical things. You need a store of Vitamin D and relaxing memories for the months ahead. If you need to do something to relieve your anxiety, buy books. Spiral bound books. The kind you can keep in your black bag. But by no means read any of those books. Nothing is going to stick at this point and you might as well enjoy your last few days of unencumbered time.

The first activity of your internship is usually an orientation period which generally includes Advanced Cardiac Life Support and, if you're a surgeon, Advanced Trauma Life Support. Awesome, intimidating. But don't worry, no one is going to let you do any of this alone for a while. Later, your department will parade a series of dignitaries and functionaries, many of whom you will never see again. You'll meet the director of nurses, the hospital president, the chief of your department and lesser chiefs of every description. You will get a lecture on fire safety and pharmacy and how the lab works. The risk manager or hospital attorney will tell you how many ways you could commit malpractice over the next year and how to avoid it. You'll hear about stress management and how to stay well rounded. And you will meet your chief residents who have been recently elevated to middle management from the working class and who take themselves very seriously on that first day. You will remember little to none of this because the same obsessive thoughts keep going through your mind — "What if I'm on call the first night? What if someone codes, or seizes?"—etc, etc.

The people you really ought to know won't be there —you have to hunt them up on your own. The secretary in your department office who can solve any housestaff problem from parking and on-call schedules to how to get a plumber to your new house; the dietary aide from whom you can grab a few sandwiches at night; and the security guard who will let you into the restricted lot when you're late and it's raining. For an intern, these are the people who really count. You probably will have some kind of social gathering to introduce you to the faculty and other housestaff. You'll put forth your best effort to be sociable but you'll really want to run away.

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This will be your first look at the characters who will share your life for the next year. Some you'll like and some you won't but you will be closer to them than to any other people you will ever know again. The largest single group, if you are going elsewhere for your training, will be the "Home Team." The "Home Team" is the crew that went to medical school there — an intimidating bunch. They seem to know all the faculty, by first name. They know which requisition you have to fill out to get a cardiac echo, they know who delivers pizza when you're on call, and they know where all the bathrooms are. Don't be intimidated by the "Home Team." You'll know everything they know by the end of the first week. And the secret that they are working so hard to conceal is that they are having the same obsessive thoughts about the next day. Pay no attention to the guy who has his Ph.D. in molecular biology and just discovered the cure for diabetes. Ignore the gal who recently came back from six months in the Third World and where she did open-heart surgery by herself with just a Swiss Army knife. Tomorrow morning you will all face the music together. And nothing you've ever done before will be quite the same as this.

Permit me a personal digression from my perspective as a teacher of housestaff. July is an exciting time for those of us involved in housestaff education. The names on a list take human form and we get our first glimpse of what the year holds in store. You see internship is an adventure for us as well ... one that we get to repeat every year.

There are only a few survival skills you need to get through this first month of internship. The first and most important is the ability to call for help. In spite of what you might believe, no one expects an intern to know very much. "Strong back, weak mind" is the working definition. That's not to say that we aren't delighted when an intern displays capabilities beyond those; they just aren't considered prerequisites for the job. Residents and attendings expect to be called with questions, to be asked what kind of IV fluids and how fast and how much insulin and how to give it and which antibiotic and how much. And "this guy doesn't look too good and I don't know what's going on and I don't know what to do next." We don't mind answering the same questions over and over. It makes us feel smart. And we're not going to let you make any serious mistakes. We'll stay one step in back of you until you're on your feet, and then two and three steps back to give you some room to grow. It's not a bother, it's the reason we're here.

The second important skill you need to bring with you or acquire quickly is the ability to work with and to learn from nurses. Interns are not the only group that looks forward to July with trepidation. Most of the nurses are seasoned, mature in their profession. They have a wealth of clinical experience. Your first patient in pulmonary edema down the hall is the 150th that the nurse has seen. She knows that you are going to order Lasix, morphine, and oxygen before you do. She may even have the meds ready for you and usually waits patiently for you to come to the same conclusion. If she is a particularly generous soul she'll say "would you like 20 or 40 mg of Lasix, 5 or 10 mg of morphine" and maintain the illusion that you know what you are doing. Make no mistake, the nursing staff can save your hide or leave you swaying in the breeze. And there's no trick to having an excellent relationship with them. Respect, common courtesy, listening to suggestions, and a sense of humility promote good feelings and good patient care. You also need to listen between the lines. "Doctor, could you take a look at Mrs. Robinson, she doesn't look good" means "get your behind out of bed before this lady arrests." And when an experienced nurse begins a sentence with "Do you think you should...?" you'd better have a *good* explanation if you don't.

In spite of the first month jitters and the pervading sense of being a beginner again, you'll experience the thrill of having your beeper go off and the operator saying "*DOCTOR* Roberts, call 2987," and knowing that you are entitled to the name. However in those first few months the sound of the beeper (yours or anyone's in the immediate vicinity) or the phone in your on-call room will variously make you break out in a cold sweat, induce diarrhea, or give you hives. I broke out in hives after supper for the three months I was on the private service during my internship year, earlier on weekends. I tried to blame it on the food, but it never seemed to happen after lunch. If you are lucky, you'll be scheduled to be on call the first night. I mean it when I say lucky. You'll anticipate the first night of call with some distress but it's better to get it over with as soon as possible. Don't expect to get any sleep even if there's nothing going on. You roam around and look at charts and wait for the disaster that you know is about to happen. And if by some chance you manage to become supine, you'll stare at the ceiling until the first phone call levitates you a foot off the bed. The second day of internship when your buddies come in fresh in the morning to greet you, be sure you look haggard even if you weren't up all night. "How was it?" they'll ask, searching your face for clues. "Oh, really bad," you'll reply, "but I got through it." And you will be a folk hero and have learned an important lesson. Every night ends. You don't have to worry about getting through until June — only 'til the next morning.

Sometime during the summer, when the first terror has worn off, you will be introduced to the game of Roundsmanship. This game is played a little bit differently at different institutions but there are similar rules. One of the first things you will observe is the "Hammer Principle," which, for those of you not familiar with it, goes "When your only tool is a hammer, everything looks like a nail." Doctors like to find problems for which they have solutions and everyone likes to look smart, especially attendings, so you will find that the subject in rounds manages to come around to what your attending knows best. Don't fight it, use it to your advantage. Pick your attendings brain for every scrap of knowledge and experience in his field of expertise and you will get smarter. And by the way, he will think you are brilliant.

Another fact that you'll discover about attendings is that they always get the best histories. And that's not necessarily because they are smarter and are better at taking a history from a patient. You may spend hours trying to get a coherent history from the little old lady who arrives in the ER at midnight with a fever and complaints referable to every organ system. She doesn't remember when she last felt well, she doesn't remember what her first symptom was or what her medications are. She tells you to call her doctor who knows everything but she can't remember who her doctor is and even if she could, he's probably not on call. So you do the best you can, dreading the presentation tomorrow at rounds. The next day you go to the bedside and while you are telling this tale, the patient keeps interrupting you to correct the facts. And the attending, with one or two elegantly worded questions, manages to find out all the things that you could not discover in an hour of heavy interrogation. You feel like an idiot. Well, the fact is that the patient has had a night's sleep, it's daylight and she knows where she is now, you've given her something for her fever and her sensorium is clear, ... and she's had a whole night to practice the answers to your questions.

Somewhere along the way you will be put on the spot by an attending or resident. The colloquial phrase is "being pimped." It's a game generally played more to make the "pimper" look smart than to make you look dumb. You wouldn't be asked the question if they thought you knew the answer. Usually you are asked some obscure fact that the "pimper" just read about the night before. There are two things you can do. One is to refuse to play the game. This is the route I would recommend that will establish you as someone not to be messed with — a good precedent to establish early. Say you haven't the foggiest idea, implying in your tone of voice that you concentrate on understanding the basic concepts of pathophysiology and clinically relevant facts appropriate for your level of training. The other tack is to try to play the game, realizing that you are a rank amateur compared to your residents and attendings. If you choose to play, you need to know the rule of 10/50/90. This is helpful when someone asks you, for example, in what percentage of cases of leptospirosis a spleen is palpable. Now you may not remember a thing about leptospirosis but as a general rule the percentage of times any phenomenon happens in a disease is either 10, 50, or 90. If you have a vague idea that it's either rare or common, you're home free — the answer is 10% or 90%. Otherwise about half the time is a good guess. The most important thing about the game of pimping is not to care about it. Like bullies, they find someone else to play with if they don't get the expected reaction.

You will also learn that residents and attendings love to play the game of Monday morning quarterback. They mostly play it with each other but sometimes they play it with interns. No matter what you do when you are on call, someone would have done it differently. This is particularly true when you are admitting with a resident who is not your own. Did you start antibiotics? You shouldn't have. Or "What do you mean you didn't start antibiotics?" And if you should have and did, then you chose the wrong ones. Mezlo and Tobra, Cefotetan alone, Flagyl and Bactrim for the belly. Penicillin, Erythromycin, Zinacef for the lungs. With apologies to the ID consultants in the audience, antibiotics are the worst because there are so many and it matters so little which one is used. But you will see the same phenomenon with beta blockers, antiarrythmics, and psychotropics. Order an ultrasound — you should have gotten a CT scan. Get an upper GI and, oh brother, endoscopy was the test of choice. You can be sure that you'll get flak in the morning, so make sane and intelligent decisions based on your assessment of the patient, and put on your teflon raincoat and high boots for the morning. Remember, it's easy to make decisions when you are sitting comfortably in a conference chair after a full night of sleep without a patient to distract you. When all else fails, blame the attending, who usually isn't there to defend himself.

Sometime in the first few months something bad will happen to a patient and you will be convinced it was your fault. And sometimes it is. And the weight of the world descends on your shoulders. A sense of responsibility is good; a sense of guilt is paralyzing. No one gets to bear the blame alone. The patient has attendings and residents and consultants who are more responsible than you. If your error was from lack of knowledge and experience, then it is part of the cost of medical education that we all, patients included, share. And it is a failure of the system of higher responsibility that is designed to protect patients from that kind of mistake. The mistakes that you should be sure you aren't making are those that are made from a lack of interest or caring or effort or an excess of confidence. So after you've thoroughly castigated yourself (and you can be sure that you will be harder on yourself than anyone else will be) make sure you understand this error that you will never make again. You can be sure that each of us has a set of memories about mistakes that we have made that we will never make again if we live to be a thousand. No one is smart enough to do this job perfectly. Welcome to the club.

Time goes by quickly — before you know it will be the late fall. You are immersed in medicine. You are learning through your pores. You are learning things you don't even know you know. You've been running on adrenal hormones for the last four or five months and now your receptors are starting to down-regulate. The phone doesn't levitate you off the bed anymore. You're no longer clueless when the resident speaks in eponyms. But the novelty is wearing off. You are starting to hate the name *DOCTOR* Roberts and that damn beeper is a pain. You haven't seen enough of your family and you can't remember the last time you stayed awake through a movie. You have hit the first slump of the internship year. You'll start complaining to your chief resident or your attendings about how you feel and then you'll hear about "The Days of the Iron Men." The "Days of the Iron Men" are anywhere from last year to the last century, depending on to whom you are complaining. Those were the days when giants roamed the halls. Interns were on call every other night and took care of 50 patients. They didn't get paid anything and did all the lab work. Of course everyone had a great time and the only trouble with being on every other night was that they missed half the good cases. Yes, those were the "Days of the Iron Men" and they don't make interns like they used to. Now it's not socially acceptable to do mental status exams on your faculty to see if their memories are a little off, so your best move is to listen politely. You can be sure they don't make interns like they used to because medicine is not like it used to be. It's much more complex and exhausting, not just physically but emotionally. You are working hard. You're entitled to be tired. But hang in there. In a few years you'll be able to talk about the "Days of the Iron Men."

October is the month that you will get your only respiratory infection of the year. And it will last until April. Somehow orange juice and lots of rest doesn't seem to be the practical solution. So you drag yourself to work and give it to all of your colleagues and almost start to feel better just in time to be on call again. The only time you get to stay home is when you're sicker than your patients — and that's sicker than you want to be.

The holidays bring a short respite to interns. Things quiet down a little and if you are lucky you get time to spend with your families. The hospitals are festive and everyone seems a little more patient and cheerful. The patients aren't any less sick but you have gained a confidence and sense of accomplishment that you didn't have a few weeks ago. This is the time to take a breather. Go home for the holidays. Let your family wait on you hand and foot. Accept their sympathy and their indulgences. All sorts of self-centered behavior is tolerated from interns, so take advantage of it. Pretend you are 10 years old. Buy yourself a present. You've made it this far. You're halfway home.

After the holidays comes the big slump. February has to be the worst month of the year. The whole world is depressed and that includes interns. I'm sure *The House of God* was written in February. You haven't seen the sun in weeks. If you don't have the flu, everyone around you does. The hospitals are packed to the ceilings with desperately ill people who take forever to get better. And you still have four months to go. This is the time of year when you feel that the patient is your enemy; you look at patients as units of work, as obstacles to getting to bed or home. Patients are "hits" or "gomers" or "gorks." You spend more time and energy figuring out how to "turf" admissions than you do working them up. Your residents are key allies in this activity — February is the worst month for them too. After a night on call you all compare notes to see how badly they've "hurt" you. Every phone call is a chore and every time your beeper goes off you want to throw it out of the window. You're tired of never being alone, of having a dozen people always looking for you. All your patients are victims of poor compliance, self abuse, or bad luck. The great cases are the worst cases. You try to remember why you did this. Well, you needed a job and this was the only one you were qualified for ... and your student loans would become due if you didn't. You think about business school ... or dermatology. Eights months is long enough to be an intern. You've gotten almost everything you need to know out of it by now. Unfortunately the next group of medical students doesn't get out of school until June and someone has to do the work until then, so you're stuck. If you thought you could dodge the student loan police and your mother, you'd leave now. What keeps you going? You do — each other. Somewhere along the way you learned to trust and rely on each other. You prop each other up when you feel like you're going to topple over, cover when you have to get out, and provide enough shoulders for all the tears, shed and unshed. You come to their rescue and they come to yours and you know what's needed without being asked.

Just in the nick of time spring comes. The flu season is over and the weather gets better and you look up one day and you only have two more months to go. Your sense of humor returns. And it's curious but when you get called to the bedside of a patient in distress not only do you know what to do, you do it without missing a step. You can run codes in your sleep (and do so on occasion). You haven't looked at the *Washington Manual* in a month. You call your resident more often to let him know what you're doing than for advice on what to do. You can evaluate a belly in five minutes and you can treat seven varieties of shortness of breath without a second thought. What used to scare you now is exciting and you scout out all the great cases. You've developed clinical judgment. Your reflexes are honed. You've got all the right moves. You've got your own series of patients. You've saved some lives, eased some deaths. You've developed confidence in your personal abilities and humility about the abilities of your profession. You've tested your limits in this marathon in a way no sprint could ever do. And in pushing the limits of your abilities you have extended them. You have developed courage and character. You've seen the best and the worst of the human condition and the best and worst of yourself. You've felt every emotion you possess. You've changed your perception of life. Sure, it's cost you something in time and sleep and personal sacrifice but in a few months you will recognize that what you've gained has been a bargain. You have nothing to fear now — you've completed your internship year. And nothing you ever do again will be quite like it. Good luck and Godspeed.

Education for Health

A Role for Physicians and the Efficacy of Health Education Efforts

AMA COUNCIL ON SCIENTIFIC AFFAIRS

Health education efforts have grown dramatically over the past decade and seek to improve the health of individuals by providing them with information that will lead to behavioral changes and thereby result in improved health. There is now substantial evidence to support the idea that health education activities can alter health behaviors, even though the mechanisms by which health education efforts succeed are largely unknown. Physicians could add to the success of health education efforts by incorporating preventive services into their patient encounters, particularly patients in high-risk situations. There are many examples of successful physician-based interventions, and a new emphasis on preventive services in primary care is emerging.

OVER the past few decades, it has become increasingly apparent that many health problems are not necessarily amenable to traditional clinical intervention and can in fact be caused or exacerbated by individuals' life-styles. As a result, efforts to avert health problems of all kinds have led to the development of programs designed to promote healthful behavior and improve health status. These programs are generally subsumed under the rubric of "health education." ("Health promotion" is sometimes used as a synonym for "health education.")

Health education programs are founded on the belief that, by providing information on linkages between health and behavior, individuals will choose to engage in behaviors that have beneficial effects on their health and selectively avoid those with deleterious effects.[1,2] Green[1(p1089)] characterizes health education as "any combination of learning experiences designed to predispose, enable, and reinforce voluntary adaptations of individual or collective behavior conducive to health in individuals." This definition contains several important points: first, that the activities be voluntary for the individual; second, that they be applied at multiple points in the process; and, most important, that health education be focused on behavior change. The provision of information is simply one component of a health education program; by itself, information transfer does not constitute health education.

A Role for Physicians

Educating people for health is clearly a major undertaking, and physicians can play a major role. Providers of "education for health" are not solely people formally trained as health educators. People in a variety of professions and organizations have opportunities to offer education for health, and physicians are certainly no exception. The key is to find those target groups that are best served by any profession whose members provide health education.

Surveys have shown considerable interest in health promotion among physicians and consensus on the health-promotion activities that are considered most important,[3-5] and convincing arguments for physician involvement in health education have been made.[6] However, preventive services are not uniformly distributed among physicians. Rather, health-promotion activities tend to be carried out by physicians who themselves have better health habits and who have positive attitudes toward counseling.[7] This may not be too surprising, but health education practices by physicians also tend to be associated with such background characteristics as specialty and type of practice. In general, more prevention activities are carried out by nonsurgeons, nonfee-for-service physicians, and women physicians,[7-9] but little work has been done to explicate these patterns.

In the practice context, physicians can exert influence over their patients' attitudes and behaviors and encourage the use of community resources through appropriate referrals to outside agencies and facilities. As such, physicians' efforts would complement the work carried out by health educators, nurses, behavioral specialists, and others working in the health edu-

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From the Council on Scientific Affairs, American Medical Association, Chicago, Ill.

This is a shortened and substantially revised version of a report that was presented to the House of Delegates at the American Medical Association's Annual Meeting, June 1989, as an informational report of the Council on Scientific Affairs.

This report is not intended to be construed or to serve as a standard of medical care. Standards of medical care are determined on the basis of all of the facts and circumstances involved in an individual case and are subject to change as scientific knowledge and technology advance and patterns of practice evolve. This report reflects the views of scientific literature as of April 1989.

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cation field and add significantly to the health education armamentarium. In fact, the implementation of preventive services in the practice setting was the focus of a recent supplement of the *American Journal of Preventive Medicine.*[10]

The doctor-patient relationship provides many opportunities to encourage behavior change and is well suited to provide reinforcements for positive changes in health behavior.[1] Moreover, there is compelling evidence showing that physicians do influence their patients' behavior patterns. Nonetheless, most evidence also shows that physicians do not typically act on these opportunities in daily practice.[11]

At the same time, there are numerous examples of successful, physician-based health education activities. A recent analysis of 39 smoking-cessation programs conducted in medical practices suggests that successful programs share several common features. In particular, more success was achieved among individuals who had received "stop smoking" advice in both group and individual counseling sessions, among those with a larger number of reinforcing sessions, and among those with a greater number of intervention modalities (ie, specific interventions such as advice, nicotine gum, and written materials).[12] Similarly, Li and colleagues[18] report that physicians can obtain success rates of 20% to 25% using multiple interventions and multiple contacts with their patients. Such a multimodal approach serves as a reinforcing mechanism that is required if individuals are to successfully become former smokers.

Conducting successful health education programs for smoking cessation is, of course, not without costs, but the cost-effectiveness of specific interventions has not been determined. Green and colleagues[14] suggest that group-based methods appear to have a built-in advantage, and a recent report suggests that physician counseling against smoking is at least as cost-effective as most other preventive medical practices.[15] Clearly, in a physician-based system, cost-effectiveness will be enhanced by using group methods and allied health professionals in addition to physicians. However, it is worth noting that most of the 40 million people who have given up smoking have done so without involvement in any group program.[16]

Health education programs for hypertension have also been studied extensively.[2] Among those based in medical practices, one conducted at The Johns Hopkins University[17,18] has been well studied. The only study to date with a true experimental design, it assigned hypertension patients either to a control group that received usual care or to one of seven experimental groups that tested various combinations of three interventions.

Overall, the program led to significant improvements in compliance with medication, continuity of care, and blood pressure control and was accompanied by desirable decreases in weight. Compared with the control group, the number of patients who achieved desired blood pressures was 12% greater among those in the experimental groups; it was 28% greater in the group who received all three interventions.[17] More important, the positive benefits of the program were found to have continued over a period of at least 5 years, as hypertension-related mortality and overall mortality in the experimental groups were significantly lower than in the control group.[18] Moreover, the program was equally effective for patients with more severe hypertension.

The study is not without some problematic aspects, however. In particular, there seems to have been an inverse relationship between the number of interventions attempted and the willingness of participants to continue in the study. While no members of the control group dropped out of the study, more than three fourths of those in the group who received all three interventions dropped out.[18] Those who dropped out may have considered the costs of participation to be too high relative to the possible benefits. Clearly, health education programs cannot function if the perceived costs of participation are too high.

The Key to Physician-Based Education

Many factors affect the feasibility of providing health education in patient care, and Green et al,[19] for example, have developed a model to understand the behavior of physicians with respect to their health education activities. One factor that obviously affects the feasibility of physician-based patient education is the frequency with which patients see their physicians. According to government figures, nearly 70% of all adults see their physicians at least once per year, and more than 90% will do so within a 5-year period.[18] The average adult visits a physician more than four times each year.[20] Moreover, the single largest diagnostic category of visits to primary care physicians is preventive or presymptomatic care.[21] Clearly, people are visiting their physicians with enough frequency that health education activities could be initiated in the context of medical care and often enough that preventive services could be offered.

Of course, patients must be receptive to education and counseling on the part of the physician. According to the health belief model,[22] health behaviors are determined by the extent to which a person sees a problem as having both serious consequences and a high probability of occurrence, with actions being motivated by their perceived salience and value. Obviously, patients who come to the physician's office motivated to listen to advice are more likely to listen and adopt changes in their behavior. At the same time, even the unwilling can be given encouragement to refrain from high-risk behaviors such as smoking. By providing such advice, the physician can influence the patient's perceptions of a particular behavior's consequences.

Fortunately, people appear to be willing to at least listen to advice from their physicians, and some authorities report that people actually expect their physicians to offer advice on maintaining one's health.[23] In the context of health education, such attitudes provide opportunities for the primary care physician to reinforce health behaviors, thereby assisting patients in improving the status of their health.

Notwithstanding these opportunities to provide preventive care, there are a number of potential impediments for physicians in providing effective health education within their practices and two factors seem to stand out: physicians' beliefs about their abilities and reimbursement issues.

Preventive services obviously cost money, but current financing mechanisms generally provide little or no support for such care. Adequate reimbursement for preventive services enables the physician to invest time and effort in patient education,[19] and health education is certainly in the patient's best interest. Cost-effectiveness can be improved by using allied health personnel and providing advice in small-group settings to reduce per capita costs.

At the same time, several surveys have reported that physicians generally believe they are ill equipped to offer advice to their patients and that their advice is generally unheeded.[24,25] This view may be reflected in the fact that most smokers, for example, claim that they have never been told by their physicians that they should quit smoking,[26] so that physicians may need to become more vigilant for opportunities to provide education for health.

For physicians who feel unqualified or uncertain about handling health education issues, there is growing evidence that even minimal training can dramatically increase their skills and success. For example, physicians who entered tutorials on patient education in a hypertension study were dramatically more successful in their efforts than were control physicians who received no training.[27] In fact, the physicians who attended the tutorials not only were more successful in their interventions, but they tended to spend more time in patient education activities; these results were achieved after only one tutorial. Training must include material on the development of skills, reminder mechanisms, and office practices that can be used to encourage healthy behavioirs in patients.[28] Without such an emphasis, physician training programs are likely to yield few worthwhile results.

In short, the key to efficient and effective physician-based education for health is training. Regardless of whether the training is based in medical school or continuing education programs, training in counseling patients can yield high dividends. More important, by developing basic skills in this area, physicians will have an additional tool to use to maintain their patients' health. Minimal counseling has been shown to yield relatively large benefits.

Finally, a trend that is emerging as part of the development of preventive services in medical practice is the notion of a periodic health examination.[29,30] It has become clear that no set of screening, immunization, or counseling activities should be conducted for all patients on a regular basis. Consequently, the periodic examination relies on a set of age- and sex-specific health practices and sets of services that combine counseling for primary prevention and screenings for secondary prevention.

A fundamental tenet of the concept is that all physician-patient encounters are opportunities for prevention; thus, by expanding prevention opportunities, a far larger proportion of the population than is now receiving preventive services could be reached.[31]

The concept of the periodic health examination evolved from the yearly physical and, in large part, was launched by Breslow and Somers'[32] landmark article in 1977. Task forces in both Canada and the United States have examined the issue. The Canadian task force produced it comprehensive document on such examinations a decade ago,[33] and the US Preventive Services Task Force has recently released its *Guide to Clinical Preventive Services.*[34]

Thus, in addition to training in the basics of patient counseling, successful programs in physician-based education for health will be targeted on those individuals most amenable to counseling and those most in need of behavior change. The former includes individuals seeing the physician at a routine preventive visit, during which advice and counseling could be given, while the latter group is made up of individuals at high risk who need to make significant changes in their life-styles to achieve desirable health goals.

The Efficacy and Benefits of Education for Health

It is clear that many physician-based health education efforts have been successful in changing the health behaviors of patients, and the evidence is equally clear that proper training could enhance the ability of physicians to provide their patients with education for health. Moreover, as noted above, physicians' efforts would complement the health education work done in other settings and extend health education to people who might otherwise be missed, particularly people with high-risk behaviors.

The benefits of health education activities are obvious insofar as improved health outcomes may follow from healthy behaviors, and programs have been successful in changing behaviors and health outcomes across a variety of settings with heterogeneous populations. Health knowledge, behavioral change, and health outcomes have all been improved in programs carried out in the workplace, the schools, and the community at large.

For example, work-site health education efforts have doubled over the past decade, with two thirds of the nation's work sites with more than 50 employees offering at least one health promotion activity.[35,36] In general, these programs yield measurable improvements in employee health, and some report lower total health care costs, although few programs can document such savings.[35,37] Schools too are frequently targeted for health education programs, particularly for programs intended to avert smoking, alcohol use, and unintended teenage pregnancy. Several programs have established that students' knowledge of the adverse health effects of smoking can be increased,[38,39] although the long-term effects of these programs are unclear and effects appear to be small and heavily dependent on the manner in which the program was administered.[38] Similarly, short-term benefits of alcohol education programs have been demonstrated.

A number of health education programs have also targeted entire communities, using the mass media to reach large numbers of people cheaply and efficiently. While access to the mass media is not sufficient to achieve behavioral change, the media are capable of imparting knowledge. For example, the North Karelia Project in Finland[40] and the Stanford Three Community study in California[41] were community-based interventions in which the targeted populations lowered their risk factors for coronary heart disease and cardiovascular disease.

Clearly, health education can have positive effects, and there is little doubt that health education programs have led some people to change their health behaviors. Furthermore, the evidence from studies such as Framingham[42] on the effects of life-style on health seems overwhelming, so life-styles that include better health behavior should improve health status. However, we are only beginning to understand what elements of health education programs make those programs successful, and, as yet, we have little understanding of the mechanisms by which interventions affect behavior and health status.

The results raise a number of questions about the importance—not the efficacy—of health education relative to other, more global changes occurring in society. Several groups that have not been targeted for in-depth health education programs appear to have achieved improved health; recent declines in mortality caused by heart disease may be a prime example of this phenomenon. Of course, secular trends may offer opportunities for health education programs. In such situations, health education efforts could complement or supplement "natural" improvements in health status by targeting groups at special risk or groups for whom health improvements are lagging.

Nevertheless, many questions about health education remain. This is because, more often than not, evaluations of programs are not conducted or, if done, tend to measure only short-term changes in knowledge. Long-term evaluations would be invaluable, but they are difficult and expensive to conduct. Frequently, the sponsors of health education programs are unwilling to support evaluation efforts.

However, evaluations are important if knowledge is to progress beyond its current state. The lack of evaluations in health education has been documented for well over a decade. For example, the *American Journal of Public Health* published editorials exactly one decade apart—in October 1978 and October 1988—noting the lack of evaluations in health education activities.[43,44] Similar sentiments have been expressed in the pages of *JAMA* and the *Annals of Internal Medicine* as well,[45,46] but there has been no effect on the prevalence of evaluations. The lack of evaluations means we are uncertain of the real success of intervention programs and impedes our understanding of the connections between behavioral change and health-promotion activities.

These criticisms should not be taken to suggest that health education is without merit, for there is no question that measurable benefits from programs can be documented. At the same time, without an understanding of the processes involved in changing behavior and without information on the relationship of behavioral change to health status, progress in designing health education programs will be thwarted, and health educators will be forced to rely on trial-and-error methods.

Significant effort has gone into the development of health education programs. However, as Green and colleagues[47] have noted, changes in individuals' behavior patterns must continue to be reinforced if the changes are to become permanent, and many of the behavioral changes sought in health education are not inherently rewarding. The characteristics of strong reinforcements among diverse groups of people must be identified if the health education movement is to last. It ought not be sufficient to simply indicate that health status has improved for the group under study.

Conclusion

The health education movement has progressed rapidly in this country, with exponential growth over the past two decades. Health education programs have been carried out in a wide range of settings and for a wide variety of health problems. There is no doubt that health education interventions have had a beneficial impact on health. However, the research has not clarified the mechanisms through which health education works, the people for whom it may work, the conditions under which programs work, or the nature of the interventions that work best. Intervention programs should include an evaluation component to elucidate these factors.

Among physicians, there is growing interest in the promise of education for health and prevention efforts. Numerous studies have found a willingness among physicians to provide preventive services. Although physicians' preventive efforts typically fall short of their potential, there is growing evidence that physicians exert a strong influence on their patients' behavior patterns and that offering education for health in the medical practice can effectively promote behavioral change.

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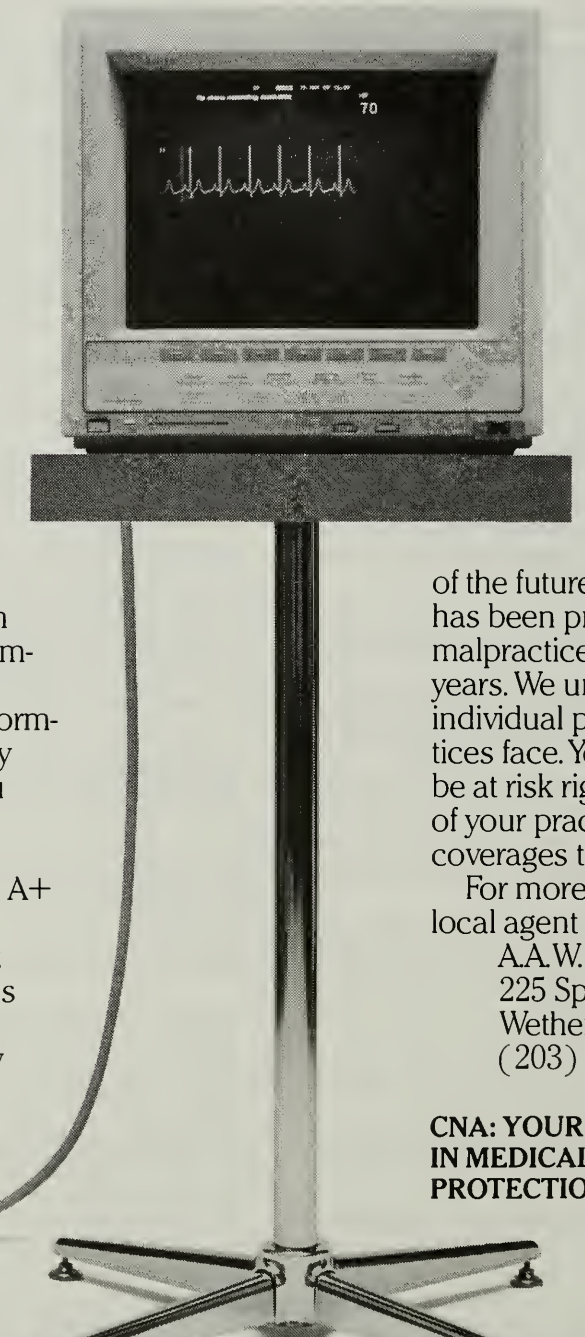

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Editorial

Guest Editorial

Universal Insurance Won't Cure Infant Mortality

It's open season on doctors, as usual. Recently, the focus has been on infant mortality, and a congressional committee has been deluged by the usual lobbyists. A recent *Washington Post* editorial reflected the impact of this propaganda by declaring:

"The infant mortality rate is not only high but a moral outrage in a country as rich as this one. But there isn't likely to be much progress in reducing it until the country figures out a way to extend health insurance to every pregnant woman and every infant."

The paragraph, I submit, is typical of the simple-mindedness that so much *Washington Post* (and other liberal) comment brings to discussion of the country's health problems. My contention is that physicians aren't to blame for the present level of infant mortality, and that even if we had universal health insurance—which is what the *Post* wants—that would not solve the problems inspiring, that newspaper's editorial indignation.

First let's recall a fact that rarely gets mentioned. The United States infant mortality rate is the lowest in the nation's history, and is now less than half of what it was 25 years ago. I suppose that fact gets ignored because the indignation-mongers don't want to present any information that might impede the desired disgust and other emotional reaction among the readers.

The doctors out on the front line of the fight against infant mortality know what's happening, and they know that the basic causes go far deeper than anything that universal health insurance can cure. Here, for example, are two quotations from Mortimer G. Rosen, MD, chairman of the Dept. of Obstetrics and Gynecology at the College of Physicians and Surgeons of Columbia University:

"The use of crack, alcohol, and other drugs and the high prevalence of diseases such as AIDS, syphilis, gonorrhea, and chlamydia have really changed the character of what we've been doing in the last five to 10 years." And further, "It's almost as if a new form of child abuse is arising in our world...The fetus has been at risk from the moment of conception, which leads to premature babies and a higher percentage of children who may be deprived of normal lives because of brain damage."

What these quotations and other similar material point to is that there are deep veins of social pathology behind the continued relatively high rates of infant mortality in our population, particularly but not exclusively among blacks.

I am struck by the fact that those who deplore these truly deplorable facts always stop short of suggesting that the women responsible for these tragedies have any culpability. It is always society or doctors or hospitals or somebody else who is to blame. The woman who goes crazy on crack or gets AIDS from her heroin-addicted boyfriend is never blamed.

Or take the fact that the United States has higher rates of teen-age pregnancy than any other developed nation. Can any reasonable person think that doctors can cure the social disorganization and the collapse of the family that lie behind this tragedy? And need we be surprised that teen-age mothers—some of them only 14 and 15 years old—tend to see more of their babies die than do mothers in their 20s and older?

As I see it, the surprise is not that this country's infant mortality is as high as it is, but rather that it has continued declining for many years now and continues to decline even in the face of new threats such as mothers with AIDS and mothers who are crack addicts, to say nothing of mothers who are themselves still children.

At the Columbia medical school referred to above, over 95% of the babies born weighing as little as 1,000 grams (2.2 lbs.) now survive, a significant improvement over the 1980's rate of 60% survival. But regional perinatal networks that have made possible such declines in mortality of preterm infants impose significant costs to accomplish their scientific miracles. So when doctors do what they are capable of doing—saving lives—they come under criticism for costing so much money.

The country not only wants lower infant mortality, but it wants it, like the rest of medical care, on the cheap. When *The Washington Post* and newspapers like it inveigh about the obscene cost of medical care, they never seem to consider the heavy cost in terms of human effort and modern mechanical equipment required to save the life of even a single baby born weighing 1,000 grams.

Some recent studies of particular micro-areas of this country have shown that in some such tiny regions the health and death records are uncomfortably close to the figures prevailing in Third World areas such as, say,

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Bangladesh, rather than what we associate with the United States or other advanced lands.

What these studies uniformly ignore is that in these micro-areas the resident populations live in ways that are reminiscent of Third World areas, since their populations are largely unemployed and have little intellectual or other daily relationship to our complex and highly developed civilization.

How do we turn such domestic Third Worlders into citizens capable of living and functioning effectively in the complex society and technology of our first world? This is the basic problem. But its solution goes far beyond what doctors can do and certainly beyond any desirable results obtainable from automatic free care for pregnant women and newborn babies. It is in the chaotic conditions prevailing when these women become pregnant that many problems they pose are evident and work their terrible damage.

The Soviet Union, despite the fact it has had national health insurance for over 70 years, has a much worse infant mortality record than we have. Against our 9.9 deaths per thousand live births, the Soviet infant mortality rate is still well above 20 deaths per thousand live births.

In the Soviet Union, however, it's well understood that the areas where the Third World death rates abound are themselves Third World areas, notably regions such as Kazakhstan, Kirgizia, Tadzhikistan and Uzbekistan. In those predominantly Moslem areas, the infant mortality rates rise sometimes to 40 or more deaths per thousand live births.

If more than 70 years of national health insurance in the Soviet Union has failed to solve the terrible problems posed there by Third World islands in the midst of a modern industrial nation, what reason do we have to suppose that national health insurance here would solve our similar problem?

Harry Schwartz, Ph.D.

New York

Update: Influenza—United States, 1988-89 Season

As of January 13, 1989, 186 culture-confirmed cases of influenza in the United States had been reported to CDC. One hundred fifty (81%) of these were influenza type B viruses, 28 (15%) were type A (H1N1), and eight (4%) were type A(H3N2).

Age was reported for 99 of the persons with type B influenza. Although these cases occurred in persons aged 5 months to 77 years, 55 (56%) of these persons were $\leq$ 18 years of age. These viruses were reported from 23 states and were implicated as the etiologic agent in four of the five culture-confirmed influenza outbreaks reported since mid-November. These four outbreaks occurred in elementary schools in Ohio, Nebraska, California, and Washington, where maximum absenteeism levels during the outbreaks ranged from 14% to 36%.

The 28 influenza A(H1N1) viruses were reported from 11 states (Arizona, California, Colorado, Hawaii, Illinois, Ohio, Massachusetts, New York, Minnesota, Washington, and Wisconsin). The only outbreak associated with these viruses occurred at a Wisconsin university in December. During the outbreak's peak, approximately 25% of persons seen at the outpatient student clinic had an influenza-like illness; seven isolates of influenza A(H1N1) virus were recovered from 17 specimens tested from these students.

Four states (Florida, Hawaii, New York, and Pennsylvania) and the District of Columbia reported influenza A(H3N2) viruses but no outbreaks.

Editorial Note: During the 1987-88 influenza season, influenza A(H3N2) predominated, and influenza B appeared late (*1*). In contrast, influenza B has predominated during the 1988-89 influenza season, with most reported illnesses occurring in children. The impact that this year's influenza B activity will have on older persons and persons at high risk of serious complications or death is unknown. However, excess mortality has occurred in each of the influenza B epidemics since 1979 (*2-4*). Thus, efforts to immunize high-risk persons in all age groups should continue even as outbreaks begin (*5*).

An increased risk for Reye syndrome in children and teenagers when aspirin is used to treat influenza symptoms has been reported in years when type B influenza has predominated (*6,7*). Parents, teenagers and children who self-medicate, and health-care workers should be aware of this possible serious complication associated with aspirin use.

Amantadine, which may be indicated for prophylaxis or treatment of influenza A, is not effective against influenza B (*5*). Thus, during seasons such as this, when both influenza A and B strains circulate, virus cultures need to be obtained during outbreaks of influenza-like illness to assess the appropriateness of amantadine therapy.

A recorded message on U.S. influenza activity is now available 24 hours a day. This message is updated weekly by CDC and can be accessed at (404) 332-4551.

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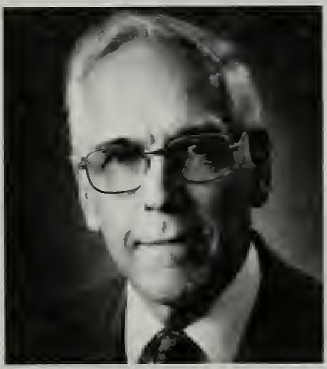
The President's Page

A Time of Transition



Continued pressure to control health-care costs is forcing us to change our traditional patterns of practice. Although one may question what the appropriate level of expenditures should be, the perception is that the current level is too high and that the allocation of health-care dollars is entirely irrational. We are confronted almost daily on television, radio, and in the printed media with ideas, suggestions, and proposals, many of which originate in Washington, D.C. The demands to reduce health-care costs, or at least prevent further escalation, arise primarily from the two largest payers, the federal government and employers. Not much has been heard from individuals, as yet, since most have been protected from the real costs by various forms of insurance coverage.

As a part of the federal budget health care ranks second only to defense and is its most rapidly growing component. Since expenditures for defense have peaked and are on the way down, health-care cost has become an even greater target for congressional budget cutters. By bits and pieces cost cuts and controls have come: for instance, hospitals are paid by DRGs and operate with Medicare allowances which are, for many, at bankruptcy levels; physicians practice now under CPRO guidelines, have had some fees frozen and/ or cut, and will have in 1992 a national fee schedule based on a resource based relative value scale (RBRVS) with Medicare volume performance (MVP) limits.

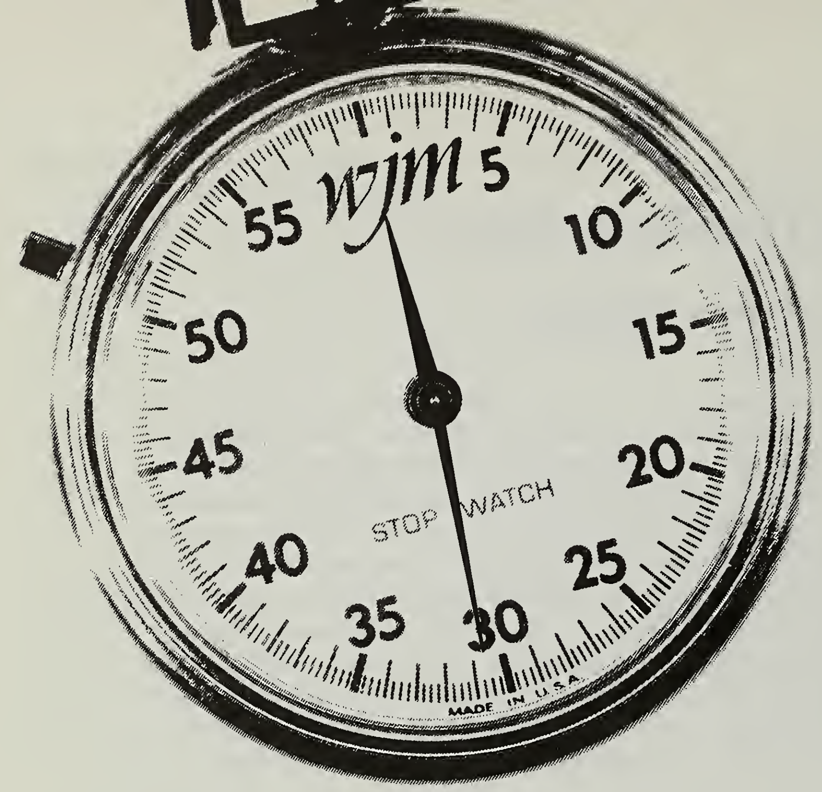
Many in Congress are demanding comprehensive reform of the entire system. Toward this end the Pepper Commission was appointed, spent 1.5 million dollars, and adopted a report by an eight to seven vote. It was declared D.O.A. before its presentation to the Congress; however, new approaches are still being studied. There is research into patterns of practice and outcomes to establish reimbursement shedules. The cost of administering Medicare and other programs is under investigation. There is even some recognition of the high cost of the present system of settling malpractice claims and the defensive medicine associated with it. Representative Nancy Johnson from New Britain, a member of the Health Subcommittee of the House Ways and Means Committee, has introduced a bill based on arbitration, but including many other worthwhile features, to address this issue.

Our health-care payment system, apart from the government, is largely employment based and employers carry a heavy payment burden. Often cited as a cause for our lack of competitiveness in international markets, this has been given a disproportionate share of the blame. Employers have adopted many government techniques but, creatively, have attempted in other ways to control costs. In some instances direct relationships have been established with large groups or hospitals. More often managed health-care plans have been used: HMOs, PPOs, and more recently EPAs (exclusive provider arrangements). None has proven entirely satisfactory and the search goes on.

What about the medical profession? We have been forced into a situation not of our choosing and one we don't like. Our patient-physician relationships have been disturbed, our office staffs have been increased and have been harassed by paper work demands, and our incomes have been cut. Any attempt to organize to contest these changes has been met with threatened or overt antitrust action. So far, we've been on the losing side.

Is it unrealistic to look for something better in the future? I don't think so. There are new attitudes and new leadership coming to the AMA. State and county medical associations are strong with talented young people moving into leadership positions. Ours is an honored and honorable profession and, I'm confident, will capably meet the challenges ahead.

Roger S. Beck, M.D.
President



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Talking of Change

ROBERT U. MASSEY, M.D.

At a recent conference on medical education and medical licensure, curriculum reform was, in one way or another, the substance of every speaker's talk, as it has been for as long as I have been attending meetings of this kind. This is as it should be; it would be difficult to believe that many teachers seriously proposed educational reform during the long centuries of scholastic and Galenic domination, and yet medical education did change, or progress, from those times to ours.

We talked of changing the curriculum 45 years ago when I was in medical school. Some of the young basic science assistant professors assured us first year medical students that we would appreciate all this stuff if only we knew some clinical medicine and had sense enough to ask questions about why things worked the way they did. Basic science should come at the end of our education, some of them said, and not at the beginning. They were partly right; many of us can remember, as senior students or house officers, looking up the half-forgotten details of Starling's Law of the heart, or the hemoglobin-oxygen dissociation curve in our Best and Taylor. In those days basic sciences were closer to clinical medicine, and, although, we never saw a patient during those first two years except from the back row of an amphitheater, our work in biochemistry, bacteriology, anatomy, physiology, pharmacology, and pathology made us feel that we were on the way and getting close. That seemed especially true during the long afternoons in the laboratories when we could talk clinical medicine with the professor and feel that here was exactly where we belonged.

Since the remarkable development of cellular and molecular biopsy, however, that relationship between the clinical and basic sciences is less apparent; in fact, to some of our students, and perhaps to even more of our faculty, it hardly exists at all. Students, even those who report that they enjoy their basic science courses, wonder how much of what they must memorize will have any value to them when they get into clinical work. Defenders of the basic sciences insist that becoming fluent in the language of modern biomedical science is what matters, and that something important, even essential, will remain after the details are forgotten.

They undoubtedly are right, but, as scientists and educators, we should be more precise about that "something important, even essential." And if we knew what we meant by that, perhaps our teaching could be more efficient of the student's time. Beginning with a clinical problem, a friendly library, a clinically naive student, and a wise and knowledgeable faculty member, the opportunities for learning are immense. Medical students in the morning of their careers have a love affair with medicine. This is what Alfred North Whitehead has called "the stage of romance," the "stage of first apprehension." A good teacher will make use of the energy of youthful enthusiasm when "[t]he subject—matter has the vividness of novelty"; and "...holds within itself unexplored connexions with possibilities half-disclosed by glimpses and half-concealed by the wealth of material."[1]

This problem-based approach is being used in several medical schools throughout North America. The advantage of our system in which each medical school is free to develop its own curriculum within limits (not true in many European countries) is that we have controls and can compare results. So far scores on the National Board examinations and student performance in the clinical years do not appear to have been affected adversely; benefits of the new curricula may show up in other, perhaps unmeasurable, ways. Students may come to take the basic sciences seriously, important to their understanding of clinical medicine, and not just as an obstacle course to be run. One house officer told me that for him the chief value of his two years of basic science was that he was two years older and more mature when he began his clerkships. Another said she had learned what she needed of basic sciences only after beginning her residency.

Student perceptions ought to be taken with a grain of salt, and so should most faculty views on education. Reform takes place continually. History rarely moves by great leaps and discontinuities, but energy is needed to keep a forward momentum; fortunately for us, medical schools are not, at least yet, under the thumb of some frozen central bureaucracy. When there is freedom to change, change is certain.

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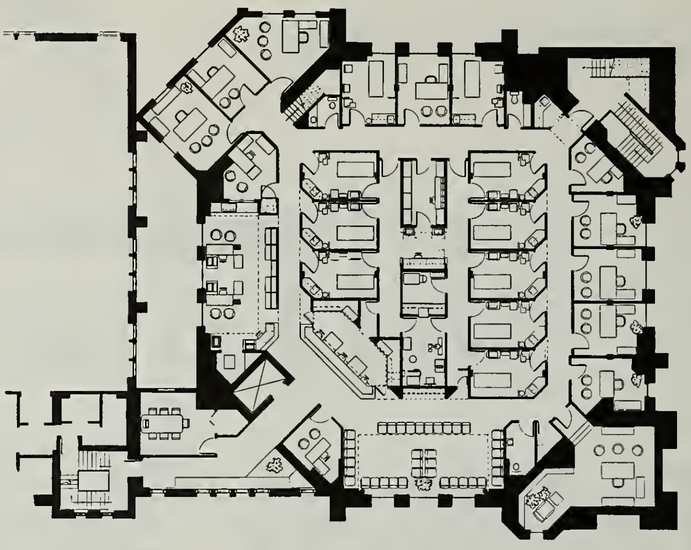

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LAW, MEDICINE AND PUBLIC POLICY

Treating a Jehovah's Witness Adult: Beneficence or Respect for Autonomy?

JOSEPH M. HEALEY, J.D.

Among the treatment refusal cases providing the greatest difficulty for physicians are those which involve Jehovah's Witnesses and the refusal of blood transfusions and blood products. The conflict between the patient's autonomy and the doctor's perceived duty to preserve life is especially poignant when the refusing party is a parent with minor children. A recent New York case[1] examined this conflict and clarified the rights and duties of both the patient and the doctor. While not a directly relevant precedent for those who practice in Connecticut, it represents the most recent examination of these issues by the court of highest jurisdiction of a state, and provides good insight into current thinking about the right to self-determination in health care.

The patient, Denise Nicoleau, was a 36-year-old practical nurse and member of the Jehovah's Witness religion. When she became pregnant, she sought prenatal care at the medical center at which she hoped to deliver the child. She informed the doctor of her religious beliefs, and of her inability to consent to transfusions because of her religious beliefs. On the forms submitted for her signature at the time of her admission to the hospital, she consented to the performance of necessary procedures, but specifically excluded the administration of blood, plasma, or other derivatives of blood.

Late in her pregnancy, the patient went into labor, was admitted to the hospital, a Caesarian section was performed, and a healthy boy was delivered. Following the operation, she began to hemorrhage and emergency surgery was performed. Her doctor informed her after the operation that in his judgment she would die without a transfusion. Nonethless, the patient, supported by her husband, refused the transfusion on religious grounds.

When the doctor informed the hospital officials, they decided to seek court approval of the transfusion. They went into court at 9:00 a.m. of the same day to obtain the order. At noon, the court granted the order allowing the hospital to administer necessary blood transfusions. The patient and her family received no notice of the hospital's court petition and no notice of the fact that the order had been granted by the court until late in the same day. At approximately 6:00 that evening, she received the first transfusion. Two days later, she received a second transfusion. The patient and her husband filed suit to vacate the court order which had permitted the use of transfusions despite her objection.

The Appellate Court vacated the original order. The hospital appealed and the State of New York Court of Appeals affirmed the Appellate Court's decision concluding:

> In sum, the patient, as a competent adult, had a right to determine the course of her own treatment, which included the right to decline blood transfusions, and there is no showing that the State had a superior interest, in preventing her from exercising that right under the circumstances of this case. The citizens of this State have long had the right to make their own medical care choices without regard to their physical condition or status as parents.[1(p18)]

Discussion of this case will continue in next month's column.

Joseph M. Healey, J.D., Associate Professor, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington, CT.

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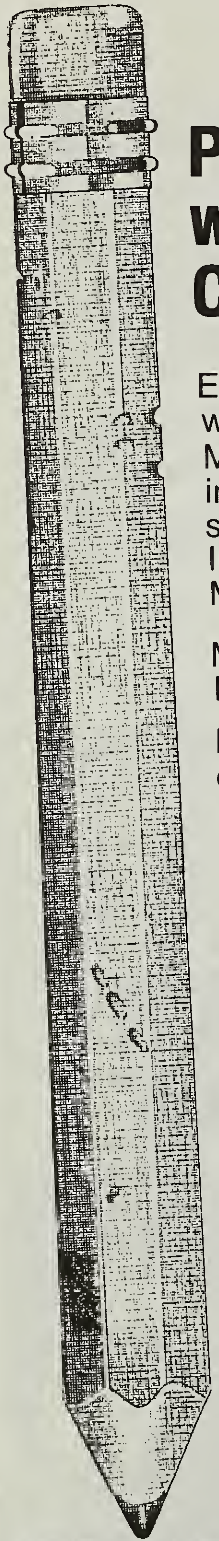

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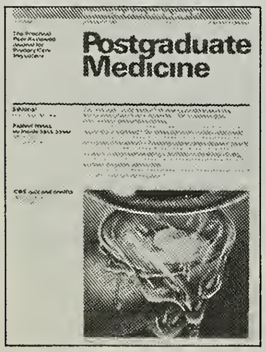

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Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalmic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it; however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

Indications: Yocon® is indicated as a sympathicolytic and mydriatric. It may have activity as an aphrodisiac.

Contraindications: Renal diseases, and patient's sensitive to the drug. In view of the limited and inadequate information at hand, no precise tabulation can be offered of additional contraindications.

Warning: Generally, this drug is not proposed for use in females and certainly must not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

Adverse Reactions: Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug.[1,2] Also dizziness, headache, skin flushing reported when used orally.[1,3]

Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.[1,3,4] 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to ½ tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.[3]

How Supplied: Oral tablets of Yocon® 1/12 gr. 5.4 mg in bottles of 100's NDC 53159-001-01 and 1000's NDC 53159-001-10.

References:
1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
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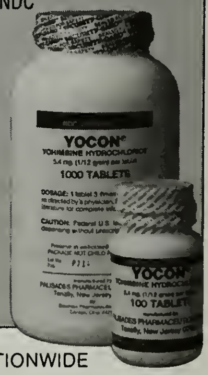
Rev. 1/85



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50 Years Ago

From the *Journal of the Connecticut State Medical Society*

May 1940

Virus Pneumonia

STANHOPE BAYNE-JONES, M.D.,
New Haven, CT

It is now well known that pneumonia in human beings may be caused by certain filtrable viruses. The chief of these are the viruses of influenza, measles and psittacosis. Lower animals also have virus infections of the respiratory tract with inflammation of the lungs and pneumonia. These natural infections in white mice have added difficulties and complexities to the study of similar infections in man. Recently the question has arisen as to whether viruses, other than those mentioned, cause pneumonia in human beings. Is there a specific type of "virus pneumonia"?

During the past two years a peculiar form of pneumonia has been seen in cities in this country and abroad. In 1938 and 1939, Dr. Hobart Reimann observed groups of cases in Philadelphia. Similar cases have been reported from New York, Boston, Chicago, St. Louis, Minneapolis, Georgia, Oregon and England. Dr., Francis G. Blake has informed me that he has seen several cases at the New Haven Hospital which might have been so-called "virus pneumonia," if such a condition exists.

The onset may be sudden or gradual, and the illness at first may be thought to be a severe cold or influenza. Occasionally after a brief period of remission the temperature may rise to 104° F and thereafter, during a week or ten days, may fluctuate between 102° and 104°. After this period the temperature gradually returns to normal in the second or third week. Among the symptoms the most prominent are hoarseness, dyspnea, cyanosis, high fever, and relative bradycardia. The white blood count is normal or slightly increased. There have been a few fatal cases. The disease has been called diffuse bronchiolitis, tracheobronchopneumonia, or bronchopneumonia. It is distinct from lobar pneumonia and pneumococci are not usually found in the sputum. In a few cases the clinical condition resembled typhoid fever, miliary tuberculosis, tularemia or psittacosis. To some observers the infection is a new disease. This appears to be unwarranted. If it is proved to be an entity it will probably be regarded, according to Reimann, as "a newly recognized severe form of an otherwise mild and perhaps commonly encountered infection of the respiratory tract."

The technic of isolation, differentiation and identifcation of the viruses of diseases of the respiratory tract is extremely difficult and costly. It requires passages through ferrets or mice, cultures in media containing living cells, and intricate immunological tests of the neutralizing powers of various serums. The natural virus infections in the animals used in the tests add hazards and uncertainties to the experimental work. Several years of intensive investigation will be required before conclusive results are obtained. It is not likely that such work will become a routine procedure of diagnostic laboratories. In the meantime physicians will continue to see cases of atypical pneumonia. These should be studied as thoroughly as possible, to make sure that the basis of supposing that a specific virus causes the disease is not laid on the failure to discover the usual bacterial incitants or on the difficulties of clinical differential diagnosis.

At present the question of etiology is unsettled. The virus obtained from two of Reimann's patients was lost before it was completely identified. Investigators whom I have consulted are very cautious in their comments, withholding opinions until more cases have been thoroughly studied. While the possibility exists and while there have been indications that there is a specific type of "virus pneumonia," it must be said today that the case is not proved.

REFERENCES

For general review see: Reimann, H. Arch. *Int Med* 1939;64:381.

*Presented at the 15th Clinical Congress, Connecticut State Medical Society, New Haven, September 19-21, 1939.

Letter to the Editor

Letters to the Editor are considered for publication (subject to editing and abridgment), provided that they are submitted in duplicate, signed by all authors, typewritten in double spacing, and do not exceed 1½ pages of text (excluding references). They should not duplicate similar material being submitted or published elsewhere. Letters referring to a recent *Journal* article should be received within six weeks of the article's publication.

TESTICULAR FEMINIZATION SYNDROME REVISITED

To the Editor: In 1988 a case was reported in *Connecticut Medicine* of a 78-year-old woman who presented with newly diagnosed testicular feminization syndrome (TFS).[1] To our knowledge this was the oldest reported patient presenting with TFS documented in the North American literature. The diagnosis was made by discovery of an atrophic right testes during surgical reduction of a newly appearing indirect right inguinal hernia. Cytogenetic studies confirmed the diagnosis.

Further evaluation was considered in order to identify and remove the presumed other undescended testes. When the patient refused further studies, they were not urged upon her because of her age and because, in fact, only a small percentage of TFS patients develop malignant degeneration of undescended testes in contrast to other types of gonadal dysgenesis.[2] It was also noted at the time that she displayed the psychological characteristics typical of TFS patients. These individuals have been noted to demonstrate strenuous adaptive behavior and exhibit great concern over their ability to maintain a normal sexual relationship with their spouses.[3]

Three years after the original surgery, the patient recently reappeared with an irreducible mass in the left inguinal region. At surgery a left inguinal hernia was found with remnants of a left testes and a hydrocele. These were removed. The pathological analysis revealed an atrophic testes with an attached 4 x 3 x 2.5 cm hydrocele sac. There was smooth muscle proliferation consistent with a benign leiomyoma but no signs of malignant degeneration.

On this admission, it was noted by many that this 82-year-old woman's preoccupation with conjugal matters had increased with time. Following the surgical repair under local anesthesia, she stunned the operating room staff by repeatedly asking for reassurance that she would be allowed to immediately resume normal sexual activity.

Robert P. Ferguson, M.D.
Irving I. Rosenthal, M.D.

Mount Sinai Hospital, Hartford

1. Khoury GM, Ferguson RP: Testicular feminization syndrome presenting in a 78-year-old patient. *Conn Med* 1988;52:584-85.
2. Morris JM, Mahesh VB: Further observations on the syndrome of "testicular feminization." *Am J Obstet Gynecol* 1963;87:731-45.
3. Alvarez MA, Barroso CC, Arce B: Psychological characterization of testicular feminization syndrome. *Reproduccion* 1983;7:9-15.

HELPFUL HINTS

Adhesive Tape

E. TREMAIN BRADLEY, M.D.

Adhesive plaster is a very useful tool. The proverbial "Band-Aid" is held on by adhesive, as are many postsurgical dressings. It is used to strap a sprained ankle or to support some fractured ribs. Removing it is another matter! The tendency is to raise a corner or end and pull the tape, either upward or along the back of the remaining tape. Each of these motions lifts the skin — which is stretchable — into a little wave or hump. This puts longitudinal traction on the under side of the wave and is painful. However, if reverse traction is applied to the exposed skin, the wave is flattened and the tape peels away with less trauma and less discomfort. Where adhesive tape covers hairy skin, its removal will cause less discomfort if it is removed as just described but with a rapid pull, and then the palm of a hand should be *immediately* applied snugly to the site of removal, using slight pressure.

Extra care is required when the adhesive has been applied to skin in moist places, or if the area has been soaked or kept moist, resulting in maceration of the epidermis. This then adheres to the tape during removal and leaves sensitive, raw, denuded skin behind. How to avoid this: Don't apply adhesive to skin in these situations. Instead, an Ace or elastic bandage may be used on the skin in some places, as for a sprained ankle. Adhesive tape may at times be necessary to hold such bandages in place. On the chest or abdomen a many-tailed binder, or one held together by Velcro is often useful. Dressings in the pelvic area are held well with jockey shorts, especially if a sanitary pad with "stickum" on the outside is used. For an axilla the same type pad can be held in place by a T-shirt.

E. TREMAIN BRADLEY, M.D., solo practice of general surgery, retired to Norfolk.

From the Executive Director's Office

COUNCIL MINUTES

Wednesday, April 4, 1990

Attendance

Present in addition to the Chairman, Dr. Joseph C. Czarsty were Drs. Ahamed, Beck, Blum, Bobruff, Brooks, Dardick, Eslami, Freedman, Hollister, Kamens, Kaufmann, Keating, Lesnik, McDonnell, Meridy, Orphanos, Petrie, Petro, Redmond, Reyelt, Jr., Robbins, Sadowski, Sosa, Wetstone, Zanker, and Zeppieri.

Also present: Mr. Norbeck, Mrs. Lindquist, Mr. Brunell, Mr. Garofalo, Mr. Tomat (FCMA), Mr. Coffey (HCMA), Mr. Freberg (NHCMA), and Mrs. David Reed (President, Auxiliary).

Absent were: Drs. Bonner, Chmieleski, Fox, Franklin, Parikh, Rose, Welch, and Zlotsky.

Reports on Related Organizations

Neil Brooks, M.D., CSMS representative on the Advance Practice Registered Nurses' (APRN'S) Regulatory Program, submitted a copy of draft regulations concerning conditions under which APRN's may practice. Dr. Brooks discussed the various regulations being proposed and it was suggested to him that many of the problems in the language or objection to the regulations could be simplified by adding the words "under the direction of a physician" where appropriate. It was VOTED to approve the draft regulations submitted and in the interim, Dr. Brooks requested the Council members to submit any suggestions they have to him directly.

Report of the President

Dr. Beck reported on his meeting with the Workman's Compensation Commissioners with the aim of developing a joint program including standardized forms for physicians to use, prepare an educational program for physicans and in some way identify some physicians who could be expert examiners for evaluation of injured people. On March 22, the President's dinner was held with the presidents and executive directors of the county associations, CSMS sections, and several others. The main purpose of this meeting was to discuss legislative issues and strategy. On April 3, several CSMS officers and staff members met with members of the General Assembly's Public Health Committee. He reported that meetings are continuing with CBIA, Commissioner Adams, and a meeting is scheduled with the Department of Motor Vehicles to discuss a bill which CSMS is sponsoring in the Legislature. He stated that he expects to attend most of the county meetings.

Dr. Beck further reported that he had attended a meeting of the CSMS Joint Practice Committee the previous evening and the subject of confidentiality of records was the main item on the agenda. A video tape of news broadcasts from Channels 2 and 7 entitled "The Central Park Jogger" were shown, displaying a flagrant breach of patient confidentiality and privacy by exposing actual patient records. Following lengthy discussion, it was VOTED that CSMS draw up a position on the issue of confidentiality citing this particular case as an example and this be addressed in a letter to the Judge involved in the case with copies to the Administrative Judge, the TV stations and to the Administrator of Gaylord Hospital indicating the Society's support for his position. It was further VOTED that the position paper also be published, in the CSMS Journal, *Connecticut Medicine* for the information of the membership.

Report of Executive Director

Mr. Norbeck reported that the Pepper Commission reported to the Congress in March on two proposals, one to provide basic health insurance to the uninsured and the other to underwrite long term care. The vote was eight-seven favoring the health insurance plan to replace Medicaid with an expanded program and employers with more that 100 employees would be required to provide employees with health insurance or contribute to a public plan on their behalf. Employers with fewer than 100 employees would be given special tax incentives to provide health insurance coverage. The vote on the long term proposal was eleven-four which would provide a federal program to pay for home care and three months care in a nursing home. The total cost for both these programs is 66.2 billion dollars and the commission is taking criticism from Congress because no explanation was given as to how to raise money to pay for the programs. On the provision to provide three months care in a nursing home, a 20% co-payment would be required for those with incomes above 200% of the federal poverty level. Therefore, nine out of twelve congressional leaders on the commission recognized the need for more affluent senior citizens to pay at least part of the benefits. The AMA, AHA, AFI—CIO all supported the commission report while the Health Insurance Association of America and almost all business organizations opposed the proposals. It was reported that unless someone finds 66 billion dollars to implement these proposals, it is unlikely Congress will give serious thought to them.

Mr. Norbeck further reported that President Bush spoke at Johns Hopkins in late February and focused his remarks on the need for substantial changes in the liability situation in the United States and sympathized with physicians and hospitals, and in early March the President met with AMA officials and expressed a real interest in resolving the issue. He stated that he is the first President to at least address the subject in a speech.

Report of the Auxiliary

Mrs. Joan Reed reported that a newsletter making an appeal for membership has been sent to the residence address of all CSMS members and thanked the CSMS staff for their cooperation.

Committee on Public Health

At the last Council meeting, it was voted to accept a report, submitted by the Committee on Public Health on "Patient Care Quality Standards for Alcohol and Drug Related Trauma", for information, study and further consideration by the Council. The Council discussed this report at length and concerns were expressed concerning the language in paragraph two of the document. The consensus of opinion was that the language in paragraph two should be stated so as to make compliance more voluntary. It was VOTED to refer the report to the Committee on Emergency Medical Services for their advice and consultation with a request that their findings be reported back to the Council in the near future.

Report of Committee on Legislation

Dr. Howard Wetstone, Chairman, reported on some of the bills that are of primary interest to CSMS. The bills discussed were: Medicare assignment, direct access by Physical Therapists, standards for licensing motorcycle operators, private review agents for healthcare utilization review, workman's compensation bills, abortion, administration of medications by school personnel, and disclosure of privileged information between physician and patient. Dr. Wetstone reviewed each of these bills as to their contents and standing now in the Legislature. He further reported that the following bills were now dead: triplicate prescription forms, eliminating the requirement or a physician's order for blood testing, maximum medical fees under workman's compensation, and the act concerning the working hours of resident physicians.

Legislative Task Force Representatives

Two bills being considered by the Legislature will require physicians to be appointed to their task forces. So that the names will be available to submit to these task forces as soon as these bills become law, the following names were proposed:

Task Force to Study and Recruit Volunteer Emergency Medical Services Personnel in the State - Dennis R. Pilarczyk, M.D., Cheshire; Thomas H. Horrigan, M.D., West Hartford; John J. Paulhus, M.D., Putnam.

Task Force to establish a Health Care Access Commission which will oversee the implementation of health care for the uninsured - Roger S. Beck, M.D. Wethersfield; Craig C. Czarsty, M.D., Oakville; Steven Wolfson, M.D., New Haven.

McKinney Scholarship

The Council was requested to appoint two designees, one each for the following committees:

(1) Fund raising/gala event committee: Richard L. Melchreit, Jr., M.D., Hartford

(2) Application/acceptance criteria committee: Dickerman Hollister, Jr., M.D., Greenwich

American College of Surgeons

Dr. Robert Boltax, New Haven, contacted the CSMS office seeking information as to how the American College of Surgeons can become involved at an organizational level with CSMS. It was VOTED to inform Dr. Boltax that there is a mechanism by which the American College of Surgeons can become more officially involved and that is through the formation of an official section of CSMS. The necessary information on how to form a section will be sent to Dr. Boltax.

Life Members

It was VOTED to receive as information the names of the following physicians who have been granted Life Membership effective 1/1/90:

Frederick S. Eadie, M.D., South Norwich (NL), Richard J. Manner, M.D., Woodbridge (NH), G. William McQuade, M.D., Fairfield (F), Barry S. Rosenberg, M.D., Woodbury (NH), Henry J. Sharon, M.D., Farmington (H), Morton H. Silberstein, M.D., New Haven (NH), Ann B. Wright, M.D., Sharon (L)

N.B. The foregoing is a summary of the proceedings and actions of the Council on April 4, 1990. Detailed minutes of the meetings are on file at 160 St. Ronan Street, New Haven, for perusal by any interested members of the Society.

CSMS PHYSICIAN PLACEMENT SERVICE

The Society maintains the Physician Placement Service as a free service to the medical profession in Connecticut. Opportunities for physicians to locate in Connecticut will be published as space permits and will be distributed to physicians making inquiries of such opportunities. Information should be sent to 160 St. Ronan St., New Haven, CT 06511 (203-865-0587).

Physicians wishing to establish practice in Connecticut are invited to submit a resume to be kept on file with the Society. An announcement of a physician's availability will be published in two issues of *Connecticut Medicine* as space permits.

Listing of physicians in the Placement Service does not in any way represent certification by the Society. Investigation of credentials and experience is the responsibility of those seeking applicants for positions.

OPPORTUNITIES FOR PRACTICE

AMBULATORY CARE

Ambulatory care facility seeks licensed physician with malpractice insurance for two to three Saturdays per month. 9:00 A.M. to 5:00 P.M. Please call 934-4357.

Family practice BE/BC physician for full time ambulatory care position. Quality medical practice; excellent opportunity. Starting at least $85,000 plus benefits and fringe package. In operation for over four years. Please contact immediately: Charles M. Parrot, M.D., 21 Montauk Ave., New London, CT 06320. (203) 447-2723.

ALLERGY

Active Allergy Practice in large, centrally located Connecticut city with large metropolitan population is available for sale. Also a small office building suitable for one or two doctors available on a sell or rent basis, within easy walking block to hospital or short drive to medical school. Write to: John F. Beakey, M.D., 25 Robeth La., Wethersfield, CT 06109.

FAMILY PRACTICE

Fairfield County. Family practitioner to join two physician's practice. Located in Danbury area (*Money Magazine's* best city in USA for quality of life). Enjoy the countryside and be within reach of New York and Boston. Excellent salary and fringe benefits; potential long-term association. Teaching hospital with 540 beds. Easy on call schedule. Immediate opening. Call (203) 426-1818 or send CV to: Family Health Care Center, 19 Church Hill Rd., Newtown, CT 06470.

INTERNAL MEDICINE

Internist wanted to join existing division of three faculty geriatricians in academic setting to provide patient care for home care and inpatient programs, starting July 1990. Ongoing academic involvement including opportunities for teaching and/or research available, if desired. Competitive salary and benefits, and four weeks vacation. For information contact: Fitzhugh C. Pannill, III, M.D., Chief, Division of Geriatrics, West Haven Medical Center, West Spring St., West Haven, CT 06516.

Internist BC/BE wanted to join private pharmaceutical research corporation. Excellent part time opportunity for combining primary care experience with medical research responsibilities. Send CV to: Medical Director, N.M.R.C., 25 Main St., Hartford, CT 06106.

Physician for group IM Practice/Walk-in Treatment Center in Farmington Valley, CT. Experienced. Board certified in IM; FP; or EM. Competitive salary and benefits. Full time. Send CV to: Box 555, Canton, CT 06019.

Stamford, CT— Unexpected vacancy for internist to join another in coastal community 45 minutes from New York City. Respond to Robert Shapiro, M.D., 1767 Summer Street, Stamford, CT 06905.

OBSTETRICS & GYNECOLOGY

Excellent opportunity for well-trained OB/GYN to join expanding practice in Manchester, CT. Progressive hospital and community. Excellent compensation package and flexible coverage arrangements. Early partnership available for right candidate. Send CV to: Thomas D. Chmielewski, M.D., 43 West Middle Tpk., Manchester, CT 06040.

ORTHOPEDIC SURGERY

Orthopedic surgeon. Hartford, CT area. Part time, board certified/eligible with clinical interest in Adult Orthopedics. Responsibilities include Inpatient/Consultation/Referral and Outpatient Clinic Activities. Flexible hours; licensure in any state accepted; malpractice insurance provided. Salary commensurate with education/experience. EOE. Please respond with CV to: Shutish Patel, M.D., Acting Chief of Staff, VA Medical Center, 555 Willard Ave., Newington, CT 06111.

PART TIME

The OPTIFAST Program at Manchester Memorial Hospital is looking for physicians, board certified in family practice, internal medicine, etc., to provide physical exams for program participants on weekday evenings. Interested applicants should contact Susan Frampton, 647-6671.

The Pomfret/Dayville area office of the Division of Rehabilitation Services is in need of a physician to serve as a part time Medical Consultant, three to four hours a month. The current rate of reimbursement is $45.00 per hour. Specifically, a District Medical Consultant is responsible for interpreting medical data and reports, recommending medical/psychiatric treatment services and monitoring client progress reports, identifying functional limitations, advising on the adequacy of medical information, clarifying the need for further diagnostic services, developing community medical resources, and acting as liaison with the medical community within the districts. Interested individuals may contact Robert Igo, Director of the Division's Norwich District Office at 887-3546.

PART TIME (continued)

Part time Medical and/or Psychiatric Consultants; various hours and locations statewide. Please contact John Galiette, Acting Chief, Bureau of Organizational Support, 10 Griffin Rd., North, Windsor, CT 06095. Telephone: 298-2032.

PEDIATRICS

Opportunity immediately available for BC/BE pediatrician who desires to participate in established, quality care pediatric practice. Practice presently has two physicians and now seeks a third. Salary leading to possible partnership. Contact Jane Rudolph, M.D., 179 Roseland Ave., Waterbury, CT 06710. (203) 574-4747.

PRIMARY CARE/INTERNAL MEDICINE

Internist needed for busy, four man, primary care internal medicine office. Suburban Hartford. Member wishes retirement. Terms negotiable. Send replies to: CSMS, c/o PC/HJ.

PSYCHIATRY

Wanted—Psychiatrist to share office space three days weekly, Fairfield, CT. 259-6787.

RADIOLOGY

Radiologist wanted for general radiology, ultrasound and mammography in private office practice in Waterbury area. Full time associate preferred but will consider part time. All replies confidential. Reply CSMS, c/o RAD/DF.

Full time or permanent part time position with growing practice in eastern Connecticut. Position available now and includes coverage in two hospitals and two private imaging offices. Competive salary and fringe benefits. Three radiologists in practice. Shoreline area is a great place to live. Send CV to: John Foster, M.D., 21 Montauk Ave., New London, CT 06320.

Board certified or board eligible radiologist to join a hospital and multi-office group practice in North Central Connecticut. Applicant should be competent in all imaging modalities including CT and MRI. Training in interventional radiology is desirable but not essential. Salary first year leading to full partnership. J. Danigelis, M.D., 151 Berle Rd., South Windsor, CT 06074.

PHYSICIANS WISHING TO PRACTICE IN THE STATE OF CONNECTICUT

FAMILY PRACTICE

Sept. '90. Age 33. Licensed in Connecticut. Presently in practice. Nat'l bds. AB cert. MD, Harvard Medical School, Boston; Res., University Hospitals, Cleveland. Prefers primary care, urgent care, adolescent or university health care type of practice. Write, Barry Knishkowy, M.D., Sasqua Pond Rd., E. Norwalk, CT 06855.

INTERNAL MEDICINE

July '91. Age 32. Nat'l bds. AB cert. MD, Autonomus University of Guadalajara, Guadalajara, Jalisco; Int., Res., and Fellowship, College of Medicine & Dentistry of New Jersey—New Jersey Medical School, Newark. Prefers group or associate type practice. Write, Joseph L. Ianello, M.D., 72 Newark Ave., Apt. #5, Belleville, NJ 07109.

March '90. Age 36. Nat'l bds. AB cert. MD, Albert Einstein College, Bronx, NY; Int. and Res., Morristown Memorial Hospital, Morristown, NJ. Prefers any type of practice especially group and ambulatory care. Write, Mark Tieman, M.D., 6 Gilbert Lane, Plainview, NY 11803.

Gastroenterology. Available July 1991. Age 34. Presently in practice. Nat'l bds. AB cert. MD, George Washington University, Washington, DC; Int. and Res., Walter Reed Army Medical Center, Washington, DC; Fellowship, Brooke Army Medical Center, San Antonio, TX. Prefers group or associate type practice in a medium-sized community. Write, Richard I. Andorsky, M.D., 5824 Weatherford Rd., Fayetteville, NC 28303.

PAID CLASSIFIED ADVERTISING

All paid classified advertising orders, correspondence and payments should be directed to: CONNECTICUT MEDICINE, Classified Department, 160 St. Ronan St., New Haven, CT 06511, Tel. (203) 865-0587. The classified rates are as follows: $60.00 for 25 words or less; plus $1.00 for each additional word. For confidential answers, the cost is $3.00 per insertion, sent in care of CONNECTICUT MEDICINE. Ad copy, with payment, must be received no later than the first day of the month preceding month of issue.

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Incidence of Listeriosis in Connecticut

MARIA L. TOSCA, M.P.H., PATRICIA MSHAR, AND MATTHEW CARTTER, M.D.

ABSTRACT—In Connecticut, 92 cases of human listeriosis were reported to the Department of Health Services from 1984 to 1988. The annual incidence per million population ranged from 7.3 in 1984 to 4.2 in 1988. The average annual incidence was 5.6 per million population. Case rates were highest in those aged 70 years and older (15.8 per million). Cases included 12 pregnant women and 11 newborns. Bacterial meningitis was the primary diagnosis in 23 cases. Of the 49 isolates of *Listeria monocytogenes* that were serotyped, 21 (43%) were type 4, 24 (49%) were type 1, and 4 (8%) were nontypable.

Introduction

LISTERIA monocytogenes is a common cause of meningoencephalitis and abortion in animals,[1] but is rarely identified as a human pathogen. Most recognized human cases have occurred in immunocompromised individuals, pregnant women, and elderly persons. Listeriosis has a wide variety of manifestations including meningoencephalitis, septicemia, influenza-like illness, and congenital infection which can result in abortion or neonatal death. In healthy adults, it can present as a transient illness with mild to moderate flu-like symptoms such as fever, abdominal cramps, vomiting, and diarrhea.

Listeria monocytogenes has been isolated from a large number of environmental sources such as soil, water, dust, and animal feed.[2] In recent years, several large outbreaks have been traced to the consumption of commercial food products, such as cole slaw, pasteurized milk, and Mexican-style cheese.[3] However, the role of food-borne transmission in causing sporadic cases of listeriosis is not well defined.

The incidence of listeriosis in the United States has not been well established. A hospital discharge survey conducted by the Centers for Disease Control (CDC) from 1980-82 estimated the incidence of listeriosis to be approximately 3.6 per million population per year.[3] In 1986 the CDC conducted a population-based study in six areas of the United States: New Jersey, Missouri, Oklahoma, Tennessee, Washington, and Los Angeles County.[4] The estimated annual incidence from this population-based study was 7.1 cases per million population. To evaluate the incidence of listeriosis in Connecticut, we reviewed reported cases of listeriosis from 1984-1988.

Methods

The State of Connecticut Department of Health Services (CDHS) has conducted laboratory-based surveillance of listeriosis since 1977. Laboratories are required to report isolation of *L. monocytogenes* from a primary specimen within 48 hours to the director of health and to the CDHS. The laboratory report form lists the patient's name, address, age, sex, physician's name, and the source of the specimen, but does not have space for clinical information. Persons were counted as cases if *L. monocytogenes* was isolated from a normally sterile site. Pregnant women were identified by specimen source (maternal placenta, amniotic fluid) or by matching names of newborns and mothers.

Listeria meningitis is reportable as a case of bacterial meningitis. Physicians are required to report a case of bacterial meningitis within 24 hours of diagnosis using the Communicable Disease Report form (PD 23). This form provides space for clinical information. Data from both sources were combined for this analysis.

Results

From 1984 to 1988, 92 cases of listeriosis were reported to the CDHS. Twenty-three cases were reported in 1984, 16 cases in 1985, 20 cases in 1986, 19 cases in 1987, and 14 cases in 1988. The average annual incidence rate for 1984-1988 was 5.6 cases per million population. Hartford County had the highest average incidence rate (8.6 cases per million population), and Tolland County had the lowest average incidence rate (1.6 cases per million population) (Table 1). While cases of listeriosis were reported throughout the year, 50% of the cases occurred during the months of July, August, September, and October (Figure 1); 11 (12%) cases were reported during the month of April, but were not clustered in any one year.

Listeria monocytogenes was isolated in all age groups (Table 2). The cases occurred primarily in newborns, pregnant women, and the elderly. The highest rates were observed in persons aged 70 years or older. Twelve pregnant women and 11 newborns were reported as having

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Table 1
Cases of Listeriosis, by County
Connecticut, 1984-88

County	*# of Cases*	*Incidence**
Fairfield	21	5.0
Hartford	36	8.6
Litchfield	5	5.9
Middlesex	5	7.5
New Haven	15	3.8
New London	3	2.3
Tolland	1	1.6
Windsor	2	4.2
Unknown	4	—
Total	92	5.6 **

*Average annual incidence per 1,000,000 for 1984-88. Annual population estimates for 1984-88, Connecticut Department of Health Services.
**Average annual incidence per 1,000,000 population.

listeriosis. Four mother/child pairs were identified by matching names. Twenty-three cases had bacterial meningitis as the primary diagnosis.

Of the 49 isolates of *L. monocytogenes* that were serotyped, 21 (43%) were type 4, 24 (49%) were type 1, and 4 (8%) were nontypable. One of the 49 isolates was subtyped 4B.

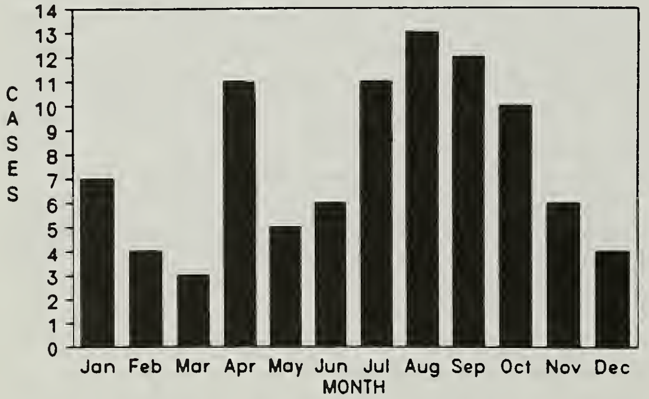

Figure 1
Cases of listeriosis by month, Connecticut 1984-88.

Discussion

Based on a review of listeriosis cases in Connecticut from 1984 to 1988, we estimated the average annual incidence to be 5.6 cases per million population. This rate is higher than CDC's estimate of the national rate based on hospital discharge data (3.6 cases per million) and lower than CDC's estimate of the population based rate (7.1 cases per million). The highest rate in the United States has been reported from Los Angeles County, California, where a combination of passive and active surveillance found the incidence of listeriosis to be 11.7 per million population[5].

The reported case rate in Connecticut is an underestimate of the true incidence of listeriosis in Connecticut. The surveillance system depends on passive reporting and underreporting occurs. A review of *L. monocytogenes* isolates for 1984-88 at three Connecticut hospital laboratories identified six isolates that were not reported to the CDHS (State of Connecticut, Department of Health Services, unpublished data).

Our results are limited by the types of data collected on the standard report forms. For example the relatively high incidence rate in Hartford County cannot be explained without detailed information on possible risk factors.

Table 2
Cases of Listeriosis, by Age Group, Connecticut, 1984-88

Age	*# of Cases*	*Incidence**
0-9	11	5.3
10-19	1	.4
20-29	6	2.2
30-39	12	4.6
40-49	7	3.7
50-59	11	6.7
60-69	11	7.0
70+	24	15.8
Unknown	9	—

*Average annual incidence per 1,000,000 for 1984-88

Many clinical and epidemiologic questions about listeriosis remain unanswered because of the low incidence of disease and its limitation to certain groups (immunocompromised persons, pregnant women, and newborns). Establishment of endemic levels and the timely reporting of new cases will aid in the detection and investigation of suspected outbreaks. Outbreak investigations can result in the identification of common sources and the implementation of control measures. While it is difficult to implement control measures for sporadic cases of listeriosis,[5] the investigation of even single cases of listeriosis can sometimes result in the identification of the source of *L. monocytogenes.*[6]

The full participation of clinical microbiologists, physicians, and other health care professionals is essential to maintaining an effective laboratory-based surveillance system. While laboratory reporting is an essential element to a state surveillance system, it is not a substitute for physician reporting. The physician also has a key role in surveillance of listeriosis. To improve our understanding of the epidemiology of this disease in Connecticut and to identify outbreaks, listeriosis became an officially reportable disease in 1990.

A standard form, known as the Communicable Disease Report (PD-23), is available for reporting listeriosis. This form may be obtained by calling the Epidemiology Program, CDHS, 566-5058. Physicians, when reporting, should clearly indicate symptoms and pregnancy status (if available and appropriate) in addition to patient's name, town of residence, age, race, sex, and date of onset. A standard laboratory form, known as OL-15C, is available for reporting significant laboratory findings such as listeriosis. This form can be obtained by calling the Laboratory Division, CDHS, 566-5102.

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Percutaneous Drainage of a Diverticular Abscess Can Make Colostomy Unnecessary in Selected Cases

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ABSTRACT—Diverticular abscess is a common acute abdominal problem in patients over 50 years of age and may require single or multiple operations. Percutaneous drainage of the abscess may permit a single operation in selected patients, making a colostomy unnecessary. This approach is probably underutilized and should become the procedure of choice in selected patients with no other medical problems such as immunosuppression. We report two patients, including one with a fecal fistula, in whom percutaneous drainage converted a situation in which two operations, one with a colostomy, would have been required, to a single operation without a colostomy. This approach saves about $7,000 per patient. The avoidance of colostomy and the cost savings make this approach attractive in selected patients with diverticular abscesses.

Introduction

PERCUTANEOUS drainage of a diverticular abscess can safely permit a single operation in selected patients, thereby avoiding both the colostomy and extra anesthesia in a two-stage or three-stage procedure. Since the original case report by Greco in 1982,[1] there have been only four additional papers from two institutions advocating this approach.[2-5] Even though this approach may be the procedure of choice in selected patients, it is probably a widely underutilized treatment modality. We report here the first two patients treated in our hospital. Both had an excellent result. We also outline the cost savings to be realized from this approach.

Case Reports

Case #1 - A sixty-one-year-old male was admitted with a one-month history of lower abdominal cramps, fever, sweats, and chills. He had been treated with antibiotics, had been in bed with limited activity for two weeks, and had lost 12 pounds. In addition to antibiotics he was on propranolol, Dyazide®, and famotidine Pepid. Physical examination revealed a large, tender, lower midline mass. White blood count was 6,700 and hemoglobin 10.7g/dL.

A computed tomographic scan (CT) on the day of admission showed a 12cm lower midline abscess with air-fluid levels (Figure 1a). A percutaneous drainage was performed. Bacteriological culture showed multiple enteric organisms. He remained afebrile but developed feculent drainage. Six days after the percutaneous drainage, contrast material injection into the abscess cavity did not show communication with the bowel (Figure 1b). He was treated with intravenous antibiotics and discharged on the eighth hospital day with instructions to take ciprofloxacin. The feculent drainage continued.

The patient irrigated the percutaneous drain three times daily with 10cc of saline, but the feculent drainage persisted. Subsequent hypaque and full barium enema showed only diverticulitis in the sigmoid colon with communication to the small abscess cavity which now measured less than 0.5cm in thickness and 5cm in diameter (Figure 1c). He was kept on clear liquids and then liquid food supplements; he gained ten pounds in weight and remained afebrile until two weeks after discharge when his temperature rose to 102° F.

He was readmitted, treated with intravenous antibiotics, and became afebrile again. At no point did he have abdominal tenderness or appear septic. His white count on admission was 7,800. On the third hospital day a primary resection and end-to-end anastamosis was performed. The patient had an uncomplicated postoperative course, passed gas on the second postoperative day, and was discharged on the fifth postoperative day.

Case #2 - A 48-year-old female was admitted with a six-day history of intermittent, bilateral lower abdominal pain radiating to the lumbar area. Antibiotic therapy was instituted by her internist for diverticulitis. The patient complained of anorexia and nausea. Past history included a total abdominal hysterectomy with bilateral salpingo-oophorectomy at which time an incidental appendectomy had been performed. Physical findings included positive rebound tenderness in the lower abdomen with bilateral suprapubic tenderness to palpa-

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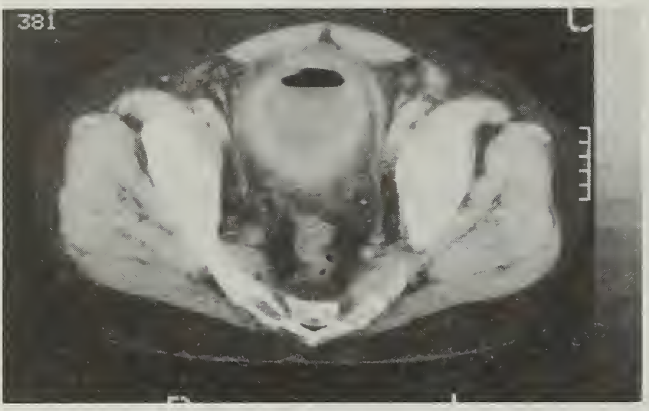

Figure 1a
CT scan shows large mid-pelvic abscess with air-fluid level.

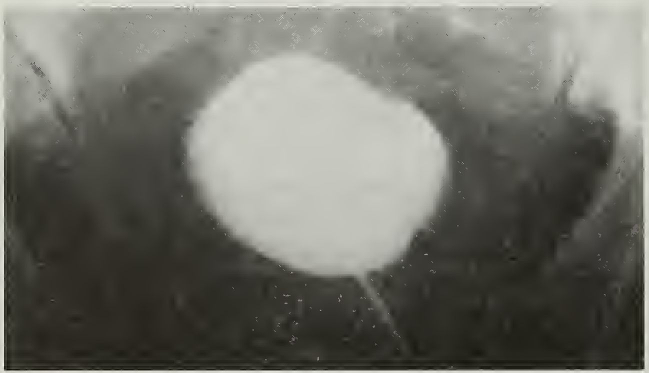

Figure 1b
Contrast injection into abscess cavity six days after percutaneous drainage delineated large cavity only.

tion. No masses were felt. A gastrografin enema showed sigmoid diverticuli but no evidence of perforation or obstruction. After initial improvement she developed episodes of diarrhea and spiking fever to 102.6° F. A CT scan of the abdomen revealed a 4cc abscess cavity low in the rectosigmoid area. Twenty-four hours later, under CT control, percutaneous drainage of the pelvic abscess was carried out (Figure 2a,b), and 60cc of purulent material was obtained. The catheter was left in place to drain and was removed three days later. The cavity had been irrigated three times a day and was found to be markedly diminished in size when the catheter was removed. Clinically, there was marked improvement after percutaneous drainage. Three weeks after discharge, she underwent an uneventful resection of the rectosigmoid colon.

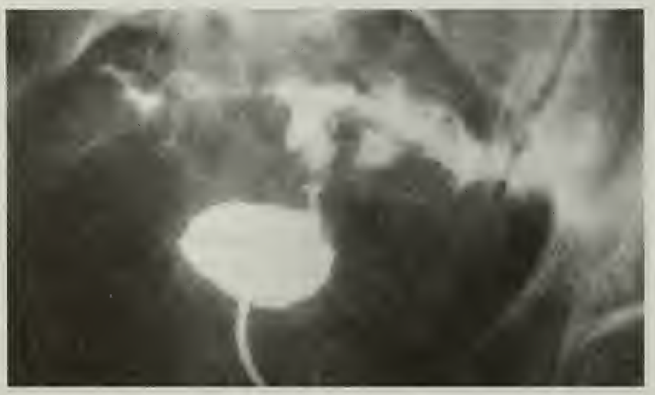

Figure 1c
Contrast injection 25 days after initial drainage shows marked decrease in cavity size and free communication with sigmoid colon.

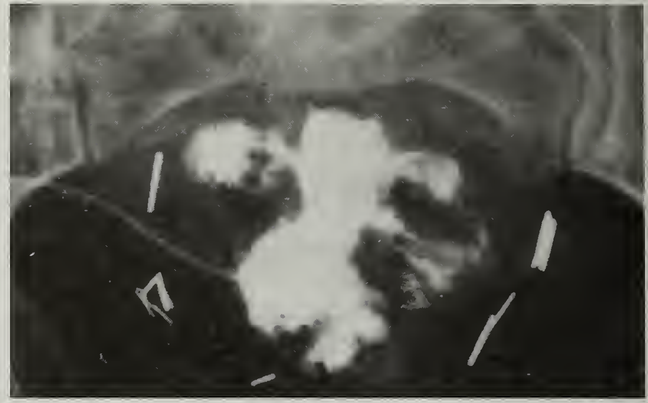

Figure 2a
CT scan shows abdominal collection anterior to rectum. White localizer line shows planned trajectory of drainage catheter.

Discussion

Diverticulitis with abscess is a common intraabdominal problem in patients over 50 years of age. Although many milder cases of acute diverticulitis can be treated successfully with antibiotic therapy, patients with larger abscesses ultimately require operation. Diverticulitis with abscess formation is best diagnosed by CT imaging in patients with sepsis and clinically severe diverticulitis in whom there is a strong suspicion of abscess formation. Diverticulitis with abscess formation may be treated with a one-, two-, or three-stage procedure. A one-stage procedure includes drainage of the abscess, resection of the colon with the diverticulitis, and reanastomosis of the colon. A two-stage surgical procedure involves resection of the involved colon, drainage of the abscess and a diverting colostomy at the first operation followed by a second operation to reanastomose the bowel. A three-stage procedure begins with a colostomy and drainage of the abscess, followed by a second operation to resect and reanastomose the colon, followed by a third operation to close the colostomy.

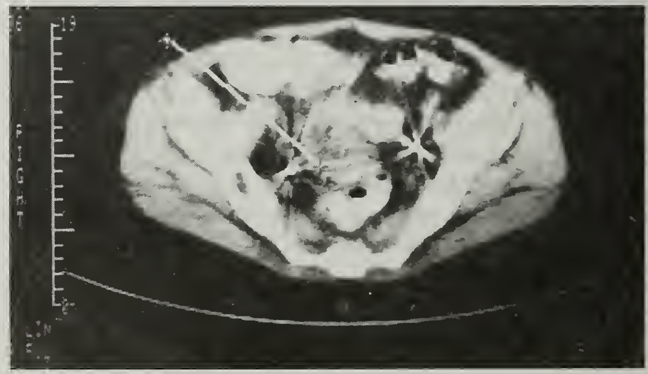

Figure 2b
Contrast injection four days drainage shows communication with rectosigmoid colon. Clips are from previous hysterectomy.

Rodkey and Welch report that an increasing number of patients at the Massachusetts General Hospital are being operated on for the septic complications of diverticulitis and note that some patients with a localized abscess can be treated by a one-stage resection while others require multistaged procedures.[6] CT scanning allows preoperative assessment of patients with diverticulitis to determine both the location and extent of the abscess.[7] Sanini, from the same institution, stresses the importance of this because in most patients with acute diverticulitis with abscess the problem can be safely managed with a one-stage resection.[2] In these patients, percutaneous drainage would not be warranted. Likewise, patients with acute diverticulitis with generalized peritonitis are not candidates for percutaneous drainage. CT can identify those patients with a defined pelvic abscess external to the sigmoid colon or its mesentery who would be candidates for percutaneous drainage. Muller, from the same institution, reported that 24 patients with acute sigmoid diverticulitis and associated pelvic fluid collection seen on CT scans underwent percutaneous aspiration. Twenty-one of 24 patients with abscess formation underwent percutaneous drainage of the abscess and 14 of the 24 patient (58%) underwent a single stage surgical procedure within 10 days of the drainage.[3]

Stabile from the University of California at San Diego used percutaneous drainage to treat 19 patients with diverticular abscesses. The mean abscess size was 8.9 cm. Fourteen of the 19 patients (74%) had an uncomplicated single stage procedure an average of 28 days after the percutaneous drainage. Most of the patients were pain free and without fever or leukocytosis three or four days after the percutaneous drainage. The patients were hospitalized for 28 days on average, but there were no operative complications and no operative mortality. Nine patients developed fistulas, three of which were feculent in nature. The three patients who had fecal fistulas did poorly, having inadequate control of infection. Stabile felt that the fecal fistula predicted persistent or recurrent sepsis and recommended early operation for these patients with a two-stage procedure.[5]

In the discussion of Stabile's paper, Rodkey recommended that this procedure not be used in immunocompromised patients, ie, those on steroids, chemotherapy, etc., but recommended it as a treatment of choice for selected patients without other problems.

Cope, et al emphasize that communication with bowel is usually not apparent at the time of initial drainage and vigorous attempts to demonstrate fistulae can provoke bacteremia and sepsis increasing the morbidity of the procedure.[8] After decompression, fistula communications are easily and safely demonstrated. Figure 1b and c illustrate this point.

Our patient with a fecal fistula (case 1), had an excellent result and avoided both a colostomy and a second operation. Stabile's conclusion that these patients do poorly and his recommendation that they have early urgent operation and a two-stage procedure is based on only three patients. In view of the excellent result our patient had, Stabile's conclusion may be premature. Further cases will be required to clear up this point.

In our second case a one-stage procedure was done 24 days after percutaneous drainage of a smaller abscess. Ottinger has stated that some of the abscesses that are drained percutaneously are small, are confined within the mesentery, and could have been resected en bloc with a one-stage colon resection (personal communication). Percutaneous drainage in these cases does not change a two-stage procedure to a one-stage procedure and may even complicate the care of the patient. Whether the abscess in this case could have been resected along with the colon during a one-stage procedure as Saini reports is unknown,[2] but certainly some surgeons would elect a two-stage procedure for such a case.

Table 1
Cost Comparisons*

	Two-Stage Operation		*Percutaneous Drainage One-Stage Operation*	
First Hospitalization				
Provider				
Surgeon	CPT 44143	$1,525	CPT 90220	$112
			CPT 90250	281
Anesthesiologist		688		
Radiologist			CPT 75990	466
Hospital	DRG 148	11,428	DRG 189	1,700
Second Hospitalization				
Provider				
Surgeon	CPT 44620	932	CPT 44140	2,061
Anesthesiologist		535		611
Hospital	DRG 152	3,712	DRG 149	6,197
Totals		$18,820		$11,428

*for a Medicare patient at Norwalk Hospital

Table 1 gives the billing numbers and charges for the standard two-stage and alternative one-stage procedure with percutaneous drainage for a medicare patient at our hospital. There is a significant savings of about $7,000 per patient. It is unknown how many patients with a diverticular abscess could be treated with this approach. However, cost savings nationwide should be significant. The savings plus avoidance of the colostomy makes this approach doubly attractive.

Conclusion

Percutaneous drainage of a diverticular abscess in selected patients can permit a single operation without a colostomy. This approach may be the procedure of choice in patients without immunosuppression or other problems in whom two operations would be required.

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Angiographic Embolization of Traumatic Hepatic Artery Pseudoaneursym

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ABSTRACT—The development of hepatic artery pseudoaneurysm represents a difficult therapeutic challenge as a vascular complication of hepatic trauma. Depending on the location of the pseudoaneurysm, this complication may represent a substantial technical challenge; recently hepatic artery pseudoaneurysms have been managed nonoperatively in selected patients. We report definitive control of a traumatic hepatic artery pseudoaneurysm with angiographic placement of detachable silicone balloons that allowed precise proximal and distal occlusion. Follow-up arteriogram at four weeks confirmed complete occlusion of the isolated segment without recurrence. The use and fate of detachable silicone balloons are discussed.

Introduction

HEPATIC artery pseudoaneurysm following blunt abdominal trauma may represent a considerable management challenge. Surgical intervention consists of proximal and distal ligation; however, location of the pseudoaneurysm, adjacent hematoma or biloma, associated injuries, and previous laparotomy may further complicate the procedure. In this setting it may be worthwhile to consider alternative therapeutic options.

Although techniques including liver-spleen scan, iodinated biliary scans (HIDA), computerized tomographic (CT) scan, and angiography have a well-defined role in the diagnosis of hepatic injury, it is only recently that radiologic intervention has achieved a place in the therapy of liver injuries.[1,2,3] Several reports over the past decade have documented successful treatment of the consequences of hepatic trauma including drainage of abscess, embolization of hepatic laceration, and closure of hepatic artery-portal vein or hepatic artery-hepatic vein fistulae.[3-9]. Many of these reports utilized angiography as an adjunctive therapy with laparotomy and not as primary intervention. Additionally there have been four reported cases of embolization of traumatic hepatic artery pseudoaneurysm utilizing gel-foam as the occluding agent.[8-10] This report describes primary treatment of traumatic hepatic artery pseudoaneurysm with an associated biloma utilizing detachable silicone balloons, which allowed precise proximal and distal control completely excluding the pseudoaneurysm.

Case Report

A 38-years old male was the unrestrained driver in a high-speed single vehicle crash. The patient was hemodynamically stable in the field and in the emergency room with blood pressure 121/91 mm Hg, heart rate of 86 beats/minute, and respiratory rate of 24 breaths/minute. Abdominal examination showed distention and epigastric tenderness. Laboratory data included a hematocrit of 43% on three serial specimens, an amylase of 85, and a lipase of 1.1. Abdominal CT scan documented hemoperitoneum, an intraparenchymal hematoma in the right lobe of the liver, a right adrenal hematoma, and a right renal contusion.

Throughout the first six days of the hospitalization, the patient was persistently febrile with temperatures ranging from 38° to 39° C. A HIDA scan on the day after admission revealed a collection of activity in the porta hepatis adjacent to a large hilar filling defect (Fig. 1) On hospital day six, a hepatic arteriogram was performed as further evaluation prior to possible abdominal exploration. The right hepatic artery originated from the superior mesenteric artery (Fig. 2) and the left hepatic artery originated from the left gastric artery. The arteriogram showeda pseudoaneurysm of the right hepatic artery. Laboratory data were as follows: white-cell count 7,711, hematocrit 36%, total bilirubin 1.36 mg/dL, SGOT 36 u/L, and alkaline phosphatase 44 u/L. Because of the location of these lesions and their delayed recognition, a clinical decision was made to attempt angiographic con-

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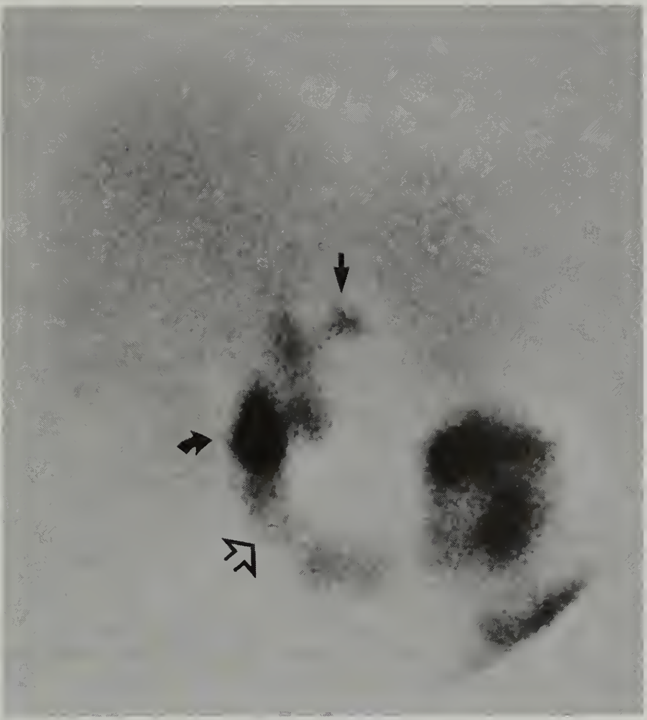

Figure 1
HIDA Scan - There is a focal collection of radionuclide activity in the porta hepatis (arrow) indicating bile leak. An area of decreased activity around the collection may be a hematoma. Gall bladder (curved arrow) and duodenum (open arrow) are seen.

trol of the pseudoaneurysm since the patient had a normal abdominal physical examination and was afebrile. On the eighth hospital day, selective right hepatic artery catheterization from the right femoral artery was performed and successful control of the pseudoaneurysm was obtained with two 2mm detachable balloons. (Becton-Dickinson, Fairfield, New Jersey) placed proximally and distally. Liver function tests were unchanged following the procedure. The patient was discharged 48 hours later and made an uneventful recovery. Follow-up angiogram at four weeks showed no evidence of pseudoaneurysm with collateral flow from the left hepatic artery to the right lobe (Fig. 3). A repeat HIDA scan at five weeks showed no biloma and a resolving hepatic defect.

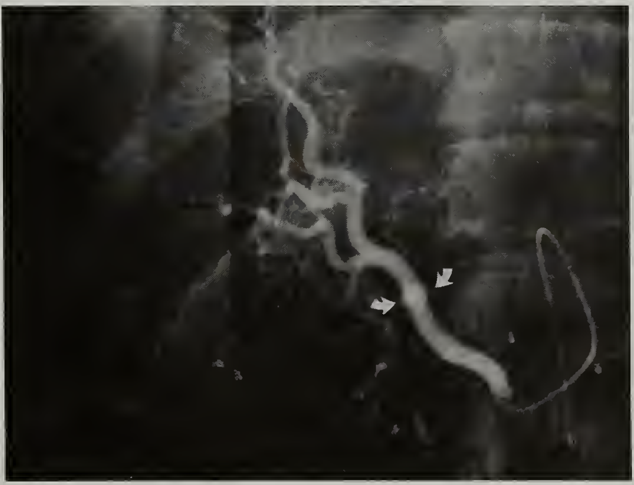

Figure 2
Right hepatic arteriogram. The right hepatic artery originates from the superior mesenteric artery. A pseudoaneurysm of the proximal right hepatic artery is seen (arrows).

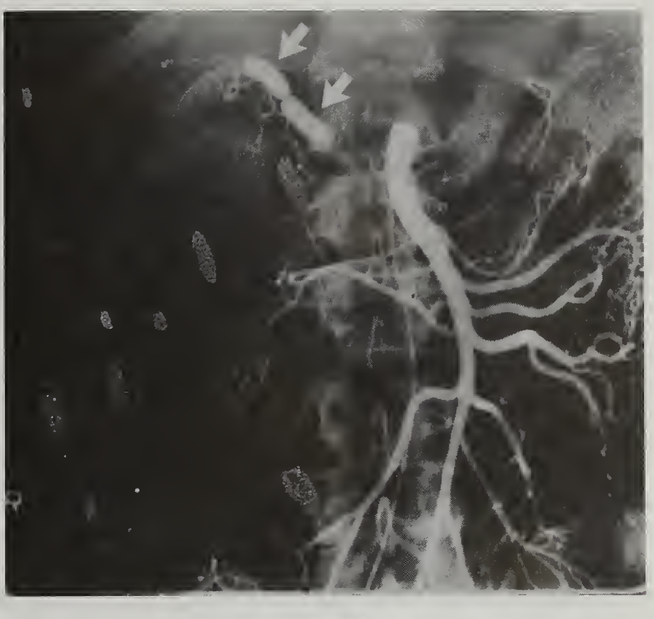

Figure 3a

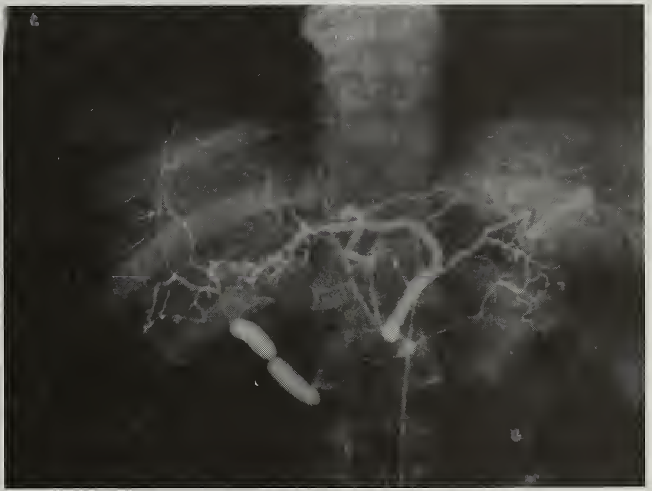

Figure 3b
Arteriogram one month postembolization. a) Superior mesenteric artery injection shows continued occlusion of the right hepatic artery by two detachable balloons (arrows). b. Left gastric arteriogram shows the left hepatic artery supplying collaterals to the right lobe, with no retrograde flow into the occluded proximal right hepatic artery.

Comment

Morbidity and mortality associated with hepatic trauma has decreased markedly but still remains high with recent series reporting an overall 9% mortality.[11,12] Many liver injuries require prompt immediate surgical intervention; in selected patients, however, nonoperative percutaneous or angiographic therapy may be the treatment of choice. A recent series reported the safety of nonoperative management of patients whose abdominal injuries were limited to the liver.[2] Detachable balloon occlusion of a pseudoaneurysm has been utilized successfully in the peripheral arterial tree.[13] The current report substantiates the efficacy of angiographic intervention in the management of hepatic artery pseudoaneurysm, and describes the use of an interventional radiology technique (ie, detachable balloons) previously unreported in liver trauma. Placing detachable balloons in this patient allowed complete isolation of the vascular injury, while maintaining right hepatic lobe perfusion by the patient's portal vein and by interlobar collaterals from the left hepatic artery.

The use of detachable silicone balloons has been described in multiple conditions, including arteriovenous malformations, aneurysms, and pseudoaneurysms of the pulmonary artery,[14] carotid-cavernous sinus,[15] renal artery,[16] and femoral artery branches.[17] In the hepatic arteries, detachable balloons were used by Mitchell *et al*[18] in patients with hemobilia to successfully occlude pseudoaneurysms and arteriovenous malformations due to transhepatic biliary catheters. As compared to the more commonly used stainless steel embolization coils, detachable balloons allow more precise positioning of the point of occlusion, and may be flow-directed to a point well beyond the guiding catheter. In addition, the vessel may be test-occluded prior to balloon detachment, with deflation and repositioning as necessary. The detachable balloon is the embolization device most analogous to the surgical ligature. For pseudoaneurysms or aneurysms, vessel occlusion using the detachable balloon allows preservation of the vessel proximal and distal to the occluded zone.

Several things can be said of the fate of detachable balloon within patients. First of all, the balloon is fixed within the vessel and bound in position by the clot that organizes around it. Secondly, the contrast within the balloon may leak out over time, making radiographic detection difficult, but it is still there. Finally, these balloons have been in use since the mid-1970s; thus far there have been no long-term sequellae or reactions to the silicone material reported.

As illustrated by the case reported here, it appears that angiography may have an increasingly important role to play in the assessment and treatment of liver injuries.

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Important Advances in Clinical Medicine

Obstetrics and Gynecology

The Scientific Board of the California Medical Association presents the following inventory of items of progress in obstetrics and gynecology. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist busy practitioners, students, research workers, or scholars to stay abreast of these items of progress in obstetrics and gynecology that have recently achieved a substantial degree of authoritative acceptance, whether in their own field of special interest or another.

The items of progress listed below were selected by the Advisory Panel to the Section on Obstetrics and Gynecology of the California Medical Association and the summaries were prepared under its direction.

Avoiding Pregnancy in Isotretinoin Users

ACNE vulgaris is a common dermatologic disorder among adolescents and young adults. Although universally considered to be a cosmetic nuisance, acne vulgaris can usually be controlled adequately using topical agents such as benzoyl peroxide combined with topical or parenteral antibiotics. Severe cases of cystic acne that do not respond to these measures often show a dramatic and prolonged remission to systemic therapy with isotretinoin (Accutane), a synthetic derivative of vitamin A. Among the adverse effects noted with isotretinoin, however, is a strong embryopathic effect causing spontaneous abortions, stillbirths, and congenital anomalies in the offspring of patients taking the drug.

In long-term follow-up, patients on isotretinoin therapy have abatement of their acne in 65% to 90% of cases. There are no alternatives to isotretinoin that can offer comparable remission rates. Side effects have generally been mild and easily managed and include skin and eye irritation, musculoskeletal pain, and headaches. The single most important risk associated with isotretinoin use is related to the intrauterine exposure of a developing fetus to the embryopathic effects of the drug. Of 36 patients who continued their pregnancies after receiving isotretinoin, 8 (22%) had spontaneous first-trimester abortions, 23 (64%) had normal infants, and 5 (14%) had malformed infants with characteristic craniofacial, thymic, and cardiac anomalies. Isotretinoin is not mutagenic nor is it stored in tissues as is vitamin A, and its tissue half-life is 10 to 20 hours. For these reasons it does not appear that isotretinoin causes teratogenicity beyond the peroid of dosing. This conclusion is supported by clinical studies. Clearly, because many candidates for isotretinoin therapy are women of childbearing age, this high rate of fetal damage mandates preventing pregnancy in users of the drug.

Current recommendations for the use of isotretinoin include limiting its use only for patients with severe cystic acne unresponsive to conventional agents, careful patient education regarding the need for adequate contraception, and assessing a patient's reliability in following a contraceptive regimen. A sensitive pregnancy test should be negative within the two weeks before initiating therapy and pregnancy tests done monthly to confirm the effectiveness of the contraceptive method. Therapy should be initiated on the second or third day of the next normal period and adequate contraception used, preferably with two methods, during the dosing interval and for one month before and after therapy. Finally, there should be adequate informed consent and documentation. The manufacturer is currently funding gynecologic consultation for women of reproductive age using isotretinoin to ensure adequate contraception counseling and informed consent.

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An Ovarian Cancer Tumor Marker, CA 125, Comes of Age

AN Antigen common to fetal coelomic epithelium and its adult derivatives, CA 125 has received intensive research and now practical clinical scrutiny in the management of ovarian carcinomas of an epithelial origin. CA 125 is tested in the serum of patients using a monoclonal antibody isolated by somatic cell hybridization techniques.

CA 125 may be found in the pleura, pericardium, peritoneum, fallopian tubes, tracheobronchial epithelium, endometrium, cervical mucus, seminal fluid, amniotic fluid, and other tissues, usually in quantities small enough to keep the serum level below 35 U per ml. More than 80% of patients with nonmucinous ovarian epithelial tumors will have elevated levels of CA 125 measurable in their serum. Whereas 59% of patients with stage I and II ovarian cancer have elevated CA 125 levels, this increases to 91% for those with stage IV disease. Studies have shown that when the preoperative level of CA 125 is less than 100 U per ml, almost all tumors can be optimally debulked. In contrast, when the preoperative CA 125 level exceeds 1,000 U per ml, even a radical operation leaves gross residual disease. Patients who are apparently disease-free following therapy and who subsequently have elevated CA 125 levels will inevitably manifest clinical disease, usually within three to five months.

Many investigators have used CA 125 levels to learn more about the role of "second-look" laparotomy in the management of ovarian carcinoma. Here the sensitivity of the test is only 33%, but the specificity is 100%. The negative predictive value is 57%, and the positive predictive value is 100%. Thus, a second-look laparotomy is unnecessary in a patient with an elevated CA 125 level except in a research setting where the quantification of disease is essential for evaluating experimental protocols.

Several studies have investigated the usefulness of CA 125 levels as a screening test. Evaluating 1,020 female blood donors using a cutoff of 65 U per ml resulted in a 1.8% positive test rate. Of these, 0.7% were pregnant and only 0.3% tested positive at a second screening. Cervical adenocarcinoma, endometrial adenocarcinoma, fallopian tube carcinoma, and nongynecologic cancerous lesions such as those of the pancreas, lung, liver, breast, colon, stomach, and biliary tract have also been associated with elevated CA 125 levels. Yet elevated CA 125 levels do not necessarily imply the presence of malignancy, as elevations have also been seen with benign conditions such as pregnancy, endometriosis, menstruation, pelvic inflammatory disease, pancreatitis, peritonitis, benign ascites, and leiomyomata. Selecting a patient population with a pelvic mass for screening CA 125 levels increases the usefulness of the test. Here the sensitivity is 93% and the specificity is 87%.

In conclusion, CA 125 levels are useful in the management of ovarian carcinoma, as levels correlate with the volume of ovarian cancer present. CA 125 functions as a leading indicator of disease progression but loses considerable sensitivity during the course of disease. Likewise the predictive value of a positive test is excellent, but a decline in the value of a negative test is observed during therapy. The selection of drug-resistant cell lines that have lost the ability to make CA 125 undoubtedly contributes to these results. Further research in the area of tumor markers now focuses on the usefulness of the simultaneous measurement of several markers. It is hoped that such an approach will further facilitate the diagnosis and treatment of ovarian carcinoma.

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Drug Therapy for Genital Herpes

ACYCLOVIR, a synthetic purine nucleoside analogue, is effective when taken orally or intravenously for primary or recurrent genital herpes. During a one-year treatment trial for frequently recurring genital herpes—that is, six or more recurrences per year—the likelihood of being symptom-free for a year was increased from 2% to 44% and the mean number of recurrences reduced from 11.4 to 1.8. This degree of efficacy has led to longer treatments. But concerns that remain unanswered include the probability of viral resistance developing and increased or additional toxicity. With short-term courses, the most common adverse effects are nausea and vomiting, occurring in about 3% of patients.

The intravenous use of acyclovir requires admitting to hospital and is generally reserved for patients with life-threatening infections. Topical acyclovir is not as effective as oral, has limited efficacy in treating recurrent disease, and has no demonstrated ability to prevent recurrences. For primary genital herpes, administering acyclovir orally, 200 mg five times a day for five to ten days, has been effective in reducing the duration of shedding and severity and duration of symptoms.

Acyclovir prophylaxis—400 mg twice a day—for patients with frequent or severe recurrences has been administered for at least a year in clinical trials. Most cases with acyclovir-resistant organisms have been found in immuno-compromised patients. Such resistance has thus far not been associated with progressive disease, and in most instances subsequent recurrences were caused by acyclovir-sensitive organisms. Further studies are required to determine whether long-term suppression reduces or facilitates the emergence of clinically important drug-resistant mutants in this population.

The use of acyclovir in pregnancy, breast-feeding mothers, or newborns has not been shown safe. The Burroughs Wellcome Company has a registry of its use in pregnancy (telephone number [919]248-4017). No specific adverse effects on mothers or fetuses have been recognized. For women with primary herpes in pregnancy, some authors have recommended using acyclovir because of initial reports of associated preterm labor and slowed intrauterine growth rate. Others, however, would only recommend its use during pregnancy or childhood for life-threatening disease or herpes simplex virus infection of immunocompromised patients. Women with visible genital herpes at the beginning of labor are advised to have delivery by cesarean section to avoid the serious consequences of neonatal herpes. Many cases of neonatal herpes result from genital excretion of herpes simplex virus type 2 by a mother who may never have experienced genital herpes symptoms. Viral cultures before labor do not predict later exposures, but cultures obtained during labor of women with previous genital herpes may be valuable in identifying babies at risk for infection and lead to more timely treatment.

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β-Streptococcal Cultures in Obstetrics

β-HEMOLYTIC streptococci play a role in two major areas of obstetrics: puerperal fever (primarily group A or *Streptococcus pyogenes*) and antepartum and intrapartum infections (primarily group B or *Streptococcus agalactiae*). All standard antibiotic regimens for the treatment of puerperal fever or postpartum endomyometritis include coverage for group A streptococci, and this organism is no longer responsible for the mortality that it was in the past. Group B streptococci, on the other hand, have recently been recognized as important pathogens in neonatal sepsis and possibly as etiologic agents for preterm premature rupture of the membranes and chorioamnionitis.

About 10% to 30% of pregnant women carry group B streptococci in the birth canal. The rate of carriage seems to be higher in white women younger than 20 years. At birth, approximately 10% to 15% of infants delivered of carrier mothers will become colonized (as opposed to infected) with the organism. The attack rate for true infection, which can result in severe sepsis and a 50% neonatal mortality rate, is about 1 in 1,000 at term but much higher in a preterm infant, women with intrapartum fever, or in premature rupture of the membranes. Thus, the question of how to prevent infection with group B streptococci is difficult to answer and has led to controversy among experts in perinatology and neonatology, If all pregnant women were to be screened and treated to eradicate the infection during pregnancy, such treatment would benefit only the 5% of patients who may experience preterm labor or premature rupture of the membranes and the 1 per 1,000 term infants who will contract group B streptococci sepsis. This benefit would be at the cost of administering ampicillin to as many as 30% of all pregnant women. Furthermore, many such patients would become recolonized by the reservoir of organisms in the rectum; penicillinase-producing bacteria prevent the eradication of this reservoir. Repeated culturing and retreatment throughout the pregnancy would be necessary. Thus, most experts think that only patients with premature rupture of the membranes, preterm labor, or maternal fever during labor, or patients at risk for such events (twins, triplets, history of premature rupture of the membranes or preterm labor) should be cultured for group B streptococci and treated. For such patients, the best technique is to swab the outer third of the vagina, as this area provides the highest yield of cultures positive for the organism. Those patients with positive cultures and premature rupture of the membranes should be treated with ampicillin given intravenously, 1 gram every six hours, for five days or until delivery; cultures should be repeated every one to two weeks and treatment repeated if recolonization has occurred. Patients with intact membranes may be given oral ampicillin, 500 mg every six hours for five to seven days. For those patients with active labor or prematurely ruptured membranes, an alternate scheme is to treat all on admission until culture results become available. Experts appear to be equally divided concerning the relative risks and benefits of such an approach.

Certain patients should probably be screened and treated throughout the entire period of fetal viability to suppress group B streptococci colonizing the birth canal. This group includes patients with cervical cerclage, those with a previous infant who died of group B streptococcal sepsis, and patients at extremely high risk of preterm labor or premature rupture of the membranes. For this group, prescribing ampicillin, 500 mg by mouth every six hours, from approximately 24 weeks to delivery is appropriate. Penicillin V potassium, while effective against group B streptococci, has not been adequately tested and may allow an overgrowth of gram-negative organisms in the vagina.

At present, then, routine screening of all pregnant women for group B streptococci is not recommended, as most will have a term birth and only 10% to 30% will be colonized at the time of screening; colonization may occur after a negative screen as well. Treatment of sexual partners also is not of benefit, as the major source of recolonization of the birth canal is the reservoir of organisms in the rectum.

If group B streptococci are searched for and eradicated in a patient at risk for perterm delivery, the severe neonatal consequences of this infection on newborns can be reduced.

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Estrogen Hormone Replacement to Minimize Cardiovascular Risk

IN the United States, heart disease is the leading cause of death in women. More than half of all women will die of some sort of cardiovascular disorder. The incidence of cardiovascular disease in women is less than that in men until the menopause occurs. After menopause, the cardiovascular disease incidence increases at the same rate as in men so that by the age of 60 it approaches that of men and by the age of 90 the disease is equally present in both sexes.

As shown by the Framingham study and others, the risk for cardiovascular disease is related to a great extent to the level of blood lipids. In particular, high levels of triglycerides, low-density lipoprotein (LDL), and total cholesterol and low levels of high-density lipoprotein (HDL) place one at an increased risk for cardiovascular disease. Currently 50% of women in the United States have a total blood cholesterol level greater than that recommended by the National Institutes of Health. Because a 1% decrease in the cholesterol level produces a 2% decrease in the incidence of coronary artery disease, efforts to reduce blood cholesterol levels are warranted.

Following the menopause, levels of cholesterol and LDL increase and levels of HDL decrease. The replacement of estrogen after either the natural menopause or surgical castration has been shown to prevent these changes and favorably alter the lipid profile in women. Estrogen therapy decreases total cholesterol and LDL levels whereas it increases HDL levels. If the risk reductions associated with these changes in blood lipids are combined, a significant reduction would be expected in the risk of cardiovascular disease with postmenopausal estrogen replacement therapy. Several recent case-control and cohort studies have shown this decreased risk.

There are several estrogen preparations available on the market today. It is difficult to summarize the published data because of the various routes of administration, doses, and preparations used. Nevertheless, trends can be identified. When estrogen is given orally, it lowers cholesterol and LDL levels and raises HDL levels, but it may take up to several months for these beneficial effects to occur. When estrogen is delivered percutaneously, the favorable effects on lipids are reduced.

Because of the risk for endometrial hyperplasia and malignancy, the addition of progestin to estrogen replacement regimens is necessary in women who have a uterus. Unfortunately, the progestins have an effect on blood lipids opposite to that of estrogens and tend to raise cholesterol and LDL levels and lower HDL levels. In studies that have evaluated the combination of estrogen plus progestin, the effect on blood lipids depends to a great extent on the progestin chosen. Specifically, the 19-nortestosterone derivatives of progesterone—norethindrone and norgestrel—tend to reverse the beneficial changes seen with estrogen alone, whereas medroxyprogesterone acetate has the least, if any, adverse effect on blood lipids.

The preponderance of data would indicate that estrogen replacement therapy after menopause elicits a cardioprotective effect. The effect of adding progestin to estrogen replacement is unknown at this time, but because progestin is necessary to reduce iatrogenic malignancy, it must be added. In choosing a progestin, the lowest dose possible should be used and a product prescribed that has the least undesirable effects on blood lipids. Thus, the most appropriate combination would include medroxyprogesterone acetate added to an orally prescribed estrogen.

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Gonadotropin-Releasing Hormone Agonist Treatment of Endometriosis and Myomas

OVER the past decade, several structural analogues of gonadotropin-releasing hormone (GnRH) have been described that simulate its action if administered in a pulsatile fashion (agonists) and counteract its effects if given in a nonpulsatile fashion (antagonists). A down regulation of pituitary GnRH receptors results in an initial release of luteinizing and follicle-stimulating hormone reserve pools in gonadotrophs, followed by a protracted state of decreased gonadotropin secretion and, therefore, decreased ovarian estradiol (E_2) production. Because these agents promote a hypoestrogenic state, their usefulness lies in the treatment of E_2-dependent disorders including uterine leiomyomata and endometriosis.

Several studies have shown that treatment with a GnRH agonist will ameliorate symptoms associated with uterine leiomyomata. The response of individual fibroids to GnRH-agonist therapy varies widely, with a 10% to 80% decrease in size reported after three to six months of treatment, presumably because of different E_2sensitivities of fibroids—such as more fibrous tumors with decreased E_2 sensitivity. In general, a marked reduction in fibroid size occurs by three months of treatment. An overall decrease in total uterine volume, more predictable than a decrease in myoma size, is also complete by about three months treatment. As fibroids decrease in size, tissue planes are easier to identify and surgical extirpation is easier. In addition, uterine blood flow is diminished in the hypoestrogenic state induced by the GnRH agonist. Amenorrhea preoperatively allows a patient to replenish her hemoglobin supplies and to bank autologous blood. Also, decreased blood loss at the time of the operation decreases the need for intraoperative or postoperative blood transfusions and the likelihood of postoperative adhesion formation. Gonadotropin-releasing hormone agonists are best used as adjuncts to surgical treatment because once treatment is stopped and ovarian function resumes, usually within six weeks after stopping therapy, fibroids will regrow to their pretreatment size within four months.

Endometriosis implants are exquisitely sensitive to E_2, and GnRH-agonist therapy with ensuing hypoestrogenism is well suited to the treatment of this condition. About 80% of women with endometriosis and pelvic pain will experience notable amelioration of their symptoms within six weeks of therapy. An objective response of pelvic endometriosis to GnRH-agonist therapy has been documented, and conservative surgical therapy is generally easier after several months of treatment because of a decreased vascularity of the lesions and easier tissue planes for dissection. As with fibroids, the effects of the GnRH agonists are at best temporary, and the benefits of treatment must be weighed with the risks associated with hypoestrogenism, including decreased (reversible) bone density and possible alterations in high- and low-density lipoprotein cholesterol.

The only GnRH agonist that has been approved by the Food and Drug Administration is leuprolide acetate (Lupron, TAP Pharmaceuticals, North Chicago), and this approval is for prostate cancer treatment. Leuprolide is available in subcutaneous or intramuscular (depot) form. Doses of 0.5 to 1.0 mg subcutaneously daily for three months for fibroids or for six months for endometriosis are generally recommended. Alternatively, 3.75 mg given intramuscularly every 28 days is recommended for the depot form of the drug. It is advisable to begin administering it between days 1 and 3 of the menstrual cycle to obtain rapid ovarian suppression. Most women will become amenorrheic by four weeks of therapy. The main side effects are hot flashes and headaches. Patients expected to be on GnRH-agonist therapy for a protracted course would benefit from bone densitometry studies. Monthly checks of cholesterol levels may be useful.

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Endometrial Ablation

ENDOMETRIAL ablation using the neodymium: YAG (Yttrium-aluminum-garnet) laser resectoscope with roller-ball or wire-loop electrocautery is an effective alternative to hysterectomy for women with excessive uterine bleeding refractory to surgical or medical therapy. It is an outpatient procedure done under general or occasionally regional anesthesia with minimal inconvenience, cost, and almost no discomfort to the patient. With recent approval by the Food and Drug Administration this procedure is no longer considered experimental. It is for women whose uterus is otherwise normal or contains small fibroids, who have unusually heavy or prolonged bleeding or excessive intermenstrual bleeding. Before the procedure is done they should have had a hysteroscopy with endometrial biopsy or dilatation and curettage to rule out endometrial carcinoma, endometrial atypia, endometrial polyp, or submucosal myoma. The first two are contraindications to endometrial ablation, and the latter two can usually be treated specifically without the need for ablation. An adequate trial of hormonal management to control bleeding is recommended before ablation.

The basic principle of endometrial ablation is to destroy the endometrium, hence controlling excessive menstrual flow. The procedure is done by inserting a hysteroscope into the uterine cavity, distending it with a clear fluid medium to allow good visualization and systematically ablating the endometrium with a laser fiber or roller-ball cautery. The laser fiber is introduced through a channel in the hysteroscope. The laser beam is directed through the fiber to the endometrium to destroy it. The patients' recovery times vary from two hours to one day, with the postoperative use of aspirin or acetaminophen adequate for pain relief. Danazol or leuprolide acetate may be used for two months preoperatively to cause a pseudomenopause by suppressing the pituitary and blocking the follicle-stimulating hormone and leutinizing hormone. This makes a woman anovulatory and amenorrheic, thereby decreasing the thickness of the endometrium and allowing a more accurate and quick destruction of the uterine lining.

Over the past ten years approximately 2,500 patients were studied at several centers. Fewer than 10% of women needed the procedure repeated or a hysterectomy. Of the other patients, half of the women had minimal spotting only, while the other half had no menstrual flow at all. Considerable problems have been reported with this procedure, including bowel damage from uterine perforation, fluid overload or electrolyte imbalance from the distention medium, and bleeding during or after the procedure. The treatment of excessive menstrual flow—that has not been resolved after appropriate hormonal therapy, dilatation and curettage or both—by endometrial ablation may be a viable alternative to hysterectomy. This may become the standard therapy in the future for appropriately selected cases. Women who have this procedure should be aware that they are likely to have a small amount of bleeding. These patients may make up 20% to 30% of hysterectomy candidates.

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Medical Treatment of Ectopic Pregnancy

ECTOPIC gestations account for about 1% of all pregnancies in the United States. The availability of sensitive human chorionic gonadotropin (hCG) assays and the improvement of ultrasound technology, including the recent introduction of the vaginal probe, have facilitated the early diagnosis of ectopic pregnancies before they rupture. This has enabled obstetricians to follow a conservative approach in the treatment of ectopic gestations. The goal of such treatment is to remove the products of conception with minimal damage to the involved tube. Typically, this has been achieved by surgical management that often involves a laparotomy, although the laparoscopic removal of the products of ectopic pregnancies is gaining more acceptance.

Because of these improved methods of diagnosis, the nonsurgical management of ectopic pregnancies, both expectant management and medicinal therapy, has been used with increasing frequency in the past few years. Expectant management, which has been described in the literature for 30 years, is now much safer. Patients with falling hCG titers can often be observed for the spontaneous resolution of their ectopic gestation. The probability of such resolution is greater when the serum hCG level at diagnosis is less than 1,000 IU per liter. The hCG level should be monitored until it becomes undetectable which usually takes two to three weeks. On the othe hand, expectant management may be associated with a inflammatory reaction at the site of the ectopic gestatio and may not be the method of choice when future pregnancy is desired.

Drug therapy consists primarily of using methotrexate. This agent has been known for years to be effective i treating trophoblastic disease and has also been used i the management of abdominal pregnancy. Several report have suggested that it can be used to treat selected unruptured tubal pregnancies. The course of therapy is usuall eight days; 1 mg per kilogram of body weight of methotrexate is given intramuscularly on days, 1, 3, 5, and and 0.1 mg per kilogram of body weight of leucovori calcium (citrovorum factor) is given intramuscularly c days 2, 4, 6, and 8 to minimize toxicity. Most patien need only one course. The mean time to resolution about four weeks. This method is reported to be sa when the ectopic mass is smaller than 3 cm with an hC level of less than 10,000 IU per liter. It is contraindicat when there is sonographically detectable fetal cardi activity because of the significant risk of hemorrhage the time of disrupting the pregnancy. If these criteria a respected, the chance of resolution is more than 90 The toxic effects of methotrexate use, seen in 20% to 30 of patients, include stomatitis, elevation in liver functi test values, and slight bone marrow suppression.

A follow-up hysterosalpingogram after nonsurgi therapy for tubal pregnancy shows tubal patency on th side in 50% to 75% of cases. While this number is enco aging, it does not prove the absence of a mechani impairment of tubal ovum transport, and prospect studies are needed to compare the fertility of patier Women with small, unruptured ectopic masses and ing hCG titers who wish to maintain fertility are pro bly best treated surgically, possibly through laparosco Methotrexate can be used in those instances wher conservative operation would be associated with increa morbidity, such as with interstitial or cervical ecto gestations.

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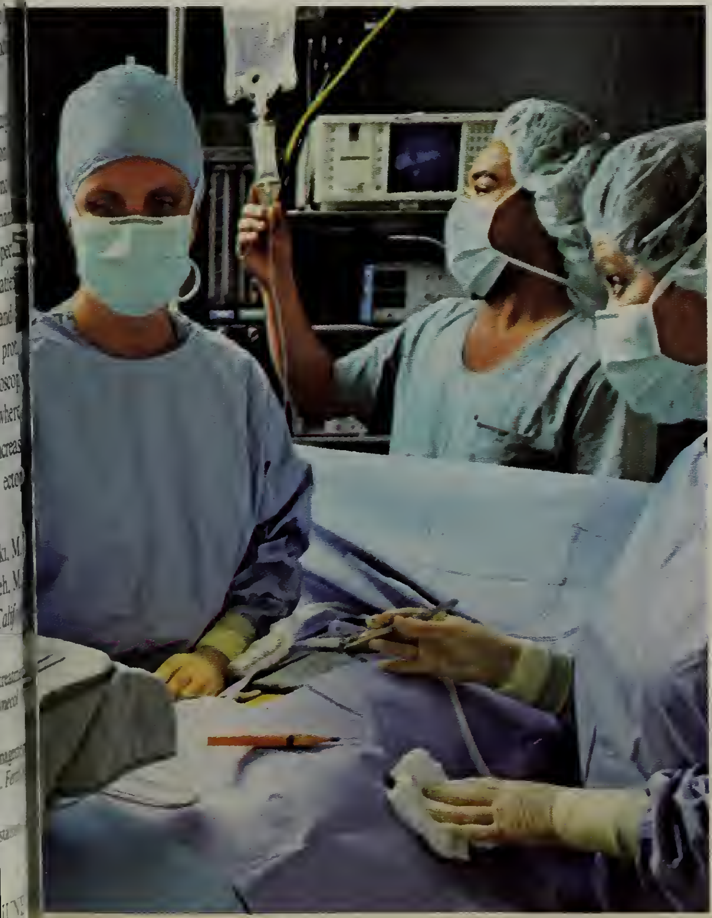
ARMY RESERVE MEDICAL PROFILE NO.9

Dr Iolwick outside of hospital where she practices as a civilian traumatologist.



olwick in operating room at Letterman Army Medical Center.

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- *Dosage for adults with active duodenal ulcer is 300 mg once nightly (150 mg b.i.d. is also available)*

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1. *USP DI Update, September/October 1988, p 120.*
2. *Br J Clin Pharmacol 1985;20:710-713.*
3. *Data on file, Lilly Research Laboratories.*
4. *Scand J Gastroenterol 1987;22(suppl 136):61-70.*
5. *Am J Gastroenterol 1989;84:769-774.*

AXID®
nizatidine capsules

Brief Summary. Consult the package literature for complete information.

Indications and Usage: 1. *Active duodenal ulcer*—for up to eight weeks of treatment. Most patients heal within four weeks.

2. *Maintenance therapy*—for healed duodenal ulcer patients at a reduced dosage of 150 mg h.s. The consequences of therapy with Axid for longer than one year are not known.

Contraindication: Known hypersensitivity to the drug. Use with caution in patients with hypersensitivity to other H_2-receptor antagonists.

Precautions: *General*—1. Symptomatic response to nizatidine therapy does not preclude the presence of gastric malignancy.

2. Dosage should be reduced in patients with moderate to severe renal insufficiency.

3. In patients with normal renal function and uncomplicated hepatic dysfunction, the disposition of nizatidine is similar to that in normal subjects.

Laboratory Tests—False-positive tests for urobilinogen with Multistix® may occur during therapy.

Drug Interactions—No interactions have been observed with theophylline, chlordiazepoxide, lorazepam, lidocaine, phenytoin, and warfarin. Axid does not inhibit the cytochrome P-450 enzyme system; therefore, drug interactions mediated by inhibition of hepatic metabolism are not expected to occur. In patients given very high doses (3,900 mg) of aspirin daily, increased serum salicylate levels were seen when nizatidine, 150 mg b.i.d., was administered concurrently.

Carcinogenesis, Mutagenesis, Impairment of Fertility—A two-year oral carcinogenicity study in rats with doses as high as 500 mg/kg/day (about 80 times the recommended daily therapeutic dose) showed no evidence of a carcinogenic effect. There was a dose-related increase in the density of enterochromaffin-like (ECL) cells in the gastric oxyntic mucosa. In a two-year study in mice, there was no evidence of a carcinogenic effect in male mice, although hyperplastic nodules of the liver were increased in the high-dose males as compared with placebo. Female mice given the high dose of Axid (2,000 mg/kg/day, about 330 times the human dose) showed marginally statistically significant increases in hepatic carcinoma and hepatic nodular hyperplasia with no numerical increase seen in any of the other dose groups. The rate of hepatic carcinoma in the high-dose animals was within the historical control limits seen for the strain of mice used. The female mice were given a dose larger than the maximum tolerated dose, as indicated by excessive (30%) weight decrement as compared with concurrent controls and evidence of mild liver injury (transaminase elevations). The occurrence of a marginal finding at high dose only in animals given an excessive and somewhat hepatotoxic dose, with no evidence of a carcinogenic effect in rats, male mice, and female mice (given up to 360 mg/kg/day, about 60 times the human dose), and a negative mutagenicity battery are not considered evidence of a carcinogenic potential for Axid.

Axid was not mutagenic in a battery of tests performed to evaluate its potential genetic toxicity, including bacterial mutation tests, unscheduled DNA synthesis, sister chromatid exchange, mouse lymphoma assay, chromosome aberration tests, and a micronucleus test.

In a two-generation, perinatal and postnatal fertility study in rats, doses of nizatidine up to 650 mg/kg/day produced no adverse effects on the reproductive performance of parental animals or their progeny.

Pregnancy—Teratogenic Effects—Pregnancy Category C—Oral reproduction studies in rats at doses up to 300 times the human dose and in Dutch Belted rabbits at doses up to 55 times the human dose revealed no evidence of impaired fertility or teratogenic effect; but, at a dose equivalent to 300 times the human dose, treated rabbits had abortions, decreased number of live fetuses, and depressed fetal weights. On intravenous administration to pregnant New Zealand White rabbits, nizatidine at 20 mg/kg produced cardiac enlargement, coarctation of the aortic arch, and cutaneous edema in one fetus, and at 50 mg/kg, it produced ventricular anomaly, distended abdomen, spina bifida, hydrocephaly, and enlarged heart in one fetus. There are, however, no adequate and well-controlled studies in pregnant women. It is also not known whether nizatidine can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. Nizatidine should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers—Studies in lactating women have shown that 0.1% of an oral dose is secreted in human milk in proportion to plasma concentrations. Because of growth depression in pups reared by treated lactating rats, a decision should be made whether to discontinue nursing or the drug, taking into account the importance of the drug to the mother.

Pediatric Use—Safety and effectiveness in children have not been established.

Use in Elderly Patients—Healing rates in elderly patients were similar to those in younger age groups as were the rates of adverse events and laboratory test abnormalities. Age alone may not be an important factor in the disposition of nizatidine. Elderly patients may have reduced renal function.

Adverse Reactions: Clinical trials of varying durations included almost 5,000 patients. Among the more common adverse events in domestic placebo-controlled trials of over 1,900 nizatidine patients and over 1,300 on placebo, sweating (1% vs 0.2%), urticaria (0.5% vs <0.01%), and somnolence (2.4% vs 1.3%) were significantly more common with nizatidine. It was not possible to determine whether a variety of less common events was due to the drug.

Hepatic—Hepatocellular injury (elevated liver enzyme tests or alkaline phosphatase) possibly or probably related to nizatidine occurred in some patients. In some cases, there was marked elevation (>500 IU/L) in SGOT or SGPT and, in a single instance, SGPT was >2,000 IU/L. The incidence of elevated liver enzymes overall and elevations of up to three times the upper limit of normal, however, did not significantly differ from that in placebo patients. Hepatitis and jaundice have been reported. All abnormalities were reversible after discontinuation of Axid.

Cardiovascular—In clinical pharmacology studies, short episodes of asymptomatic ventricular tachycardia occurred in two individuals administered Axid and in three untreated subjects.

CNS—Rare cases of reversible mental confusion have been reported.

Endocrine—Clinical pharmacology studies and controlled clinical trials showed no evidence of antiandrogenic activity due to nizatidine. Impotence and decreased libido were reported with equal frequency by patients on nizatidine and those on placebo. Gynecomastia has been reported rarely.

Hematologic—Fatal thrombocytopenia was reported in a patient treated with nizatidine and another H_2-receptor antagonist. This patient had previously experienced thrombocytopenia while taking other drugs. Rare cases of thrombocytopenic purpura have been reported.

Integumental—Sweating and urticaria were reported significantly more frequently in nizatidine- than in placebo-treated patients. Rash and exfoliative dermatitis were also reported.

Hypersensitivity—As with other H_2-receptor antagonists, rare cases of anaphylaxis following nizatidine administration have been reported. Because cross-sensitivity among this class has been observed, H_2-receptor antagonists should not be administered to those with a history of hypersensitivity to these agents. Rare episodes of hypersensitivity reactions (eg, bronchospasm, laryngeal edema, rash, and eosinophilia) have been reported.

Other—Hyperuricemia unassociated with gout or nephrolithiasis was reported. Eosinophilia, fever, and nausea related to nizatidine have been reported.

Overdosage: Overdoses of Axid have been reported rarely. If overdosage occurs, activated charcoal, emesis, or lavage should be considered along with clinical monitoring and supportive therapy. Renal dialysis for four to six hours increased plasma clearance by approximately 84%.

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New Therapies for Genital Warts

PUBLISHED randomized clinical trials have not established the treatment of choice for genital warts; no one treatment has been shown to be consistently superior to others. Hence, the choice of treatments may be used on the site of infection, size and number of lesions, and cost. Of note, observation without treatment may be an appropriate option for some patients because about a third of all genital warts disappear spontaneously within six months.

The topical treatment of genital warts predominates. Topical fluorouracil has been found to be more useful in treating vaginal than vulvar warts. Several regimens have been effective. An additional use for fluorouracil is an adjunctive therapy to prevent recurrence after warts are ablated. Biweekly application has led to a substantial decrease in the incidence of the recurrence of lesions over a six-month interval. Halogenated acetic acids (trichloroaceti or bichloroacetic acid) are probably superior to podophyllin. With these acids, there appears to be less pain and tissue reaction than with podophyllin, and systemic toxicity is not a concern. Lesions are painted with acid on a weekly basis until cured. Podophyllin use has several important disadvantages: limited efficacy, potential systemic toxicity, and the need to wash off the tincture in six to eight hours to avoid burns. Podophyllin is also applied on a weekly schedule.

The newest surgical treatment is the carbon dioxide laser. This approach is often chosen when lesions are extensive or refractory to other treatments. Laser therapy usually yields good cosmetic results. On the other hand, the equipment is costly, anesthesia of some type is required (often in an operating room), and careful training and supervision are necessary for a physician in learning the technique.

Cryosurgery and electrodesiccation are widely available in physicians' offices, inexpensive, and easy to use. Extensive lesions may require the use of local anesthesia or regional or general anesthesia in an operating room. Scarring and stricture formation are possible complications.

Interferon therapy has attracted interest as another option. Intralesional administration appears to produce fewer systemic reactions than intramuscular injections. A flulike illness associated with administered interferon has seriously limited its use. Randomized clinical trials of interferon are insufficient to establish its possible role in treating genital warts. The Centers for Disease Control suggest that interferon use not be recommended because of its relatively low efficacy, high incidence of toxicity, and high cost.

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Laparoscopic Surgery for Ectopic Pregnancy

LAPAROSCOPIC surgical treatment has become an accepted method for many patients with ectopic pregnancy. Laparoscopic treatment is indicated when the patient has provided informed consent, she is hemodynamically stable, the surgeon has the requisite equipment and operative laparoscopy experience, and intraoperative bleeding can be controlled. Early diagnosis with serial β-human chorionic gonadotropin (hCG) levels and pelvic ultrasonography increases the feasibility of a laparoscopic approach.

Treatment may involve linear salpingostomy, segmental tubal resection, or salpingectomy. Linear salpingostomy should be done if the ectopic mass is less than 5 cm in the ampulla or 2 cm in the isthmus, the woman desires future fertility, and if the tube retains a reasonable productive capability. The operation usually requires two 5-mm lower abdominal puncture sites for instruments. The ectopic pregnancy is exposed with atraumatic tubal grasping forceps. Most but not all surgeons prefer to administer 10 ml of vasopressin (Pitressin), 20 units in 100 ml of a normal saline solution, into the medical proximal mesosalpinx and 10 ml into the lateral distal mesosalpinx. The tube is then opened at the point of a maximum bulge, along the antemesenteric border, using a needle electrode, electrocautery unit, and scissors or a carbon dioxide, KTP 532, argon, neodymium: YAG laser. Results are equivalent regardless of the technique. The ectopic pregnancy will slowly extrude over a two-minute interval, after which it can be gently grasped and completely removed. Bleeding usually stops on its own, but vasopressin, bipolar cautery, laser energy, pressure, or, rarely, suturing can also be used. Copious irrigation distally and hydrotubation proximally ensure that the products of conception have been removed. The tubal incision will close by secondary intention. The laparoscopic operating time may initially be longer than that of laparotomy but will shorten as experience is acquired. Segmental resection may be preferred for large isthmic ectopic pregnancies, ruptured ectopic pregnancies, or to control hemorrhage. Salpingectomy is reserved for tubes with pronounced anatomic distortion, for women not desiring future pregnancy, or to control hemorrhage. Bipolar cauterization followed by scissor dissection can be used, or in the case of salpingectomy, loop ligatures can be applied. The products of conception can be removed with a 10-mm Senn forceps.

Women can be discharged within two hours of the operation, to be seen within two days in the office for postoperative care and to measure serum β-hCG levels. This test should be repeated at one week and thereafter at appropriate intervals until the levels disappear. About 5% to 20% of patients will have persistent β-hCG titers. Most can be managed by careful observation; a few will require a second operation. The role of chemotherapeutic agents such as methotrexate and RU 486 is being studied.

Patients who have had a salpingectomy have a 50% chance of eventually achieving a viable pregnancy, and those having linear salpingostomy have a 60% to 65% chance. Both have a 10% to 15% probability of a recurrent ectopic pregnancy. A laparoscopic procedure for ectopic pregnancy, therefore, offers comparable or improved results, with a much lesser operative procedure, less morbidity, a shorter recovery time, and reduced cost.

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Therapeutic Insemination by Donor

THERAPEUTIC insemination by donor has become widely used to treat male infertility, with between 10,000 and 30,000 births per year resulting from donor insemination. Indications for donor insemination include azoospermia, severe oligospermia, poor motility, abnormal sperm morphology, vasectomy with a poor prognosis for reversal, known genetic disorders in a man, severely Rh-sensitized woman with an Rh-positive husband, and ajaculatory dysfunction.

Because of increasing concern regarding the possible transmission of human immunodeficiency virus (HIV) during donor insemination, the American Fertility Society guidelines for the use of semen-donor inseminations were revised in 1988. It is possible for HIV to be present in fresh donor semen before the donor has become seropositive, a phenomenon that may take three months or longer after infection. Therefore, the use of fresh semen is no longer warranted and only frozen specimens should be used. The frozen specimens are then quarantined for 180 days and the donor retested and found to be seronegative for HIV before the specimen is released for use. Even then the potential for transmission cannot be eliminated.

Lower fecundity rates are reported using frozen semen than with fresh. To achieve the same cumulative pregnancy rates, about twice as many insemination cycles are required to obtain comparable results. This is most likely related to the decreased motility and shorter half-life of cryopreserved sperm than of fresh. Several factors can influence the results of an insemination program using frozen-thawed donor semen. It is not yet clear what number of total motile sperm should be inseminated, but studies have indicated the minimum necessary for acceptable pregnancy rates to be in the range of 20 million. Comparable pregnancy rates to fresh sperm were obtained in one study using 40 million total motile sperm per insemination. The recipient woman's fertility potential also plays an important role, with optimal pregnancy rates occurring when no female infertility factors are present or when a patient's ovulatory dysfunction was corrected with a course of clomiphene citrate. Endometriosis reduces fertility substantially. The route of insemination has traditionally been by the intravaginal or cervical deposition of semen. Controversy exists as to whether improved pregnancy rates might be achieved with intrauterine inseminations. Definitive studies have yet to be completed regarding the efficacy of such a method.

Overall the accepted conception rate per donor insemination cycle is 8% to 10% with a 60% to 70% pregnancy rate by the end of 12 cycles. In addition, no increased risk of miscarriage, ectopic pregnancy, or birth defects has been associated with therapeutic insemination, Couples who fail to attain pregnancy after one year of therapeutic insemination by donor should be counseled on other options including adoption, gamete intrafallopian tube transfer, or in vitro fertilization.

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Update on α-Fetoprotein Screening in California

CALIFORNIA law requires that screening for neural tube and certain other birth defects using the maternal serum α-fetoprotein (AFP) level be made available to all pregnant women.

α-Fetoprotein produced by the fetal liver appears in the maternal serum in measurable quantity by the 15th completed week and increases in concentration until term. Maternal serum AFP results are reported as multiples of the median value for a given gestational age and, as such, have provided a number of insights into conditions affecting a fetus, the pregnancy, or both.

The usefulness of maternal serum AFP screening is improved with accurate pregnancy dating and when raw values are adjusted for race, body weight, and the presence of insulin-dependent diabetes mellitus. Maternal serum AFP levels can be raised or lowered by several conditions affecting fetal AFP production or transplacental or amniotic diffusion. These conditions include multiple gestations, fetal dimise, and structural defects such as open spina bifida, gastroschisis, and omphalocele. It is necessary, therefore, to carefully examine the pregnancies of women having abnormal serum AFP values. This begins with expert high-resolution ultrasonography to confirm the gestational age and the presence of a single fetus that is viable and has no structural defect. An abnormal elevation unexplained by ultrasonography should have amniotic fluid collected for AFP determination. If the AFP level is elevated, the acetylcholinesterase level, an enzyme specific for neural tissue, is also assayed.

Using this protocol, about 95% of cases of anencephaly, 80% of cases of open spina bifida, and many ventral wall defects could be detected prenatally.

There is also increasing evidence that a high maternal serum AFP level correlates with and adverse pregnancy outcome defined as fetal death, miscarriage, prematurity, or a congenital anomaly other than those described above.

Because fetuses with Down's syndrome on average produce less AFP, low maternal serum levels can be used to identify another high-risk group of pregnancies: those at risk for Down's syndrome. The combination of maternal age (for women younger than 35 at term) and maternal serum AFP multiples of median values can be used to assign specific risk figures. These women also should be offered amniocentesis. Approximately 20% of fetuses with Down's syndrome are detectable by this method.

In California a comprehensive maternal serum AFP screening program has been in operation since April of 1986. Preliminary data reveal that during the first three completed fiscal years, about 640,000 women participated in the program and 39,000 initially had abnormal results. Many corrections were made regarding gestational age and multiple gestations, thus decreasing the number of abnormal results. There were 23,463 women whose pregnancies were evaluated at contracting prenatal diagnosis centers. Of those pregnancies, 947 had fetal abnormalities, including 457 neural tube defects, 182 ventral wall defects, 83 Down's syndrome, 118 other chromosomal abnormalities, and 107 other defects. These numbers are likely to increase because additional reports of abnormalities are being reviewed. These include cases diagnosed after abnormal maternal serum AFP results but evaluated outside of the contracted follow-up system.

The California program shows that coordinated efforts of a state health department, genetics experts, local clinicians and regional laboratories can result in an effective population-wide screening program.

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Testing for Chlamydial Infection

CHLAMYDIA trachomatis infection is the most prevalent bacterial sexually transmitted disease in the United States, causing more than 4 million infections annually at a cost of about $2 billion. Although men and infants are also affected, women are at greatest risk for serious complications, including adverse reproductive consequences such as ectopic pregnancy and infertility. To minimize the risk for these tragic outcomes and prevent further transmission, timely diagnosis and appropriate treatment are essential.

Several diagnostic tests for chlamydial infections are now available, but they vary considerably in their cost, reliability, and availability. The two methods currently used to routinely screen for and diagnose chlamydial infection are culture and antigen detection. Culture is considered to be the definitive method of diagnosing a chlamydial infection. This method, however, is expensive—at the time of writing, as much as $30 per test—because isolating *C trachomatis* requires cell culture techniques similar to those used to detect viruses. Moreover, culture requires two to four days before results are available. For these reasons, culture is more widely used by investigators than clinicians.

Two antigen-detection approaches are currently available: direct immunofluorescent staining of smears using monoclonal antibodies, and the detection of chlamydial antigen from swabs measured by enzyme-linked immunosorbent assay (ELISA). Compared with culture, antigen detection is less expensive (cost usually less than a third as much), technically easier, and may provide results within a couple of hours. The two antigen-detection tests most comprehensively evaluated are Microtrak (direct smear test) and Chlamydiazyme (ELISA). Overall, they appear to be of comparable sensitivity and specificity compared with culture, although some data suggest that the direct smear test may have a slightly higher sensitivity in urethral infections in men and specificity in cervical infections. Studies of the direct smear test show the sensitivity ranging from 60% to 100% and specificity ranging from 72% to 99%, depending on the population studied. For the enzyme immunoassay, the sensitivity ranges from 50% to 98% and specificity from 93% to 100%. Both tests appear to be associated with better results in women with cervical infection than in men with urethral infection and in symptomatic patients than in asymptomatic patients, where fewer inclusion-forming units are found. The direct smear test has also been used to detect eye and rectal infections. One distinction between the two antigen-detection tests is how they are processed: The direct smear test is labor-intensive, requiring a high-quality fluorescent microscope and an experienced microscopist, while the ELISA is less labor-intensive and more automated but requires more specialized laboratory equipment (a spectrophotometer).

Serology and cytology are the other two methods of detecting *C trachomatis*, but both are infrequently used in clinical settings. In addition to being a research tool, serology has been used to evaluate infertility in women. Cytologic methods are not routinely used primarily owing to their low sensitivity. Women with Papanicolaou smears suggestive of chlamydial infection should, in particular, receive a confirmatory test—that is, culture or antigen-detection test.

In collecting a specimen to diagnose chlamydial infection, special care should be taken to ensure that the cervical os is cleaned of mucus and debris with a swab before the specimen is obtained and that epithelial cells are collected on specimens obtained by scraping the urethra, cervix, or rectum. Because chlamydiae are obligate intracellular pathogens, specimens obtained from purulent discharges, secretions, or urine are inappropriate. In addition, specimens should be processed as instructed by laboratory protocol. This will, at a minimum, entail immediately placing the specimen in transport medium and providing timely refrigeration.

When chlamydial infection is diagnosed, patients should be treated immediately with an effective regimen. All sex partners should be examined for sexually transmitted disease and also treated promptly for *C trachomatis* with an effective regimen.

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Illicit Price of Cocaine in Two Eras: 1908-14 and 1982-89

DAVID F. MUSTO, M.A., M.D.

Introduction

THE legal status of cocaine in the United States passed through three stages: it could be legally obtained by anyone from the time of its introduction in 1884 until about 1900; then, a movement at both state and local levels restricted its availability to a physician's judgment; and lastly, after 1914, severe constraints on access to cocaine were enacted by the federal government. During the middle stage, responsibility for licit cocaine availability was increasingly assigned to physicians and pharmacists. This action during our first wave of cocaine use is similar to recent proposals to turn the cocaine problem over to health professionals and their clinical judgment. The following is a report on licit and illicit prices of cocaine during that middle or "medical stage."

When cocaine became commercially available in the United States in 1984, its purveyors were allowed an open market. Until the early 20th century, regulation of medical and pharmaceutical practice was reserved to the police powers of the states and was not an appropriate arena for federal legislation. As a result, the first legal controls on the distribution of cocaine occurred at the local and state level.

One reason there was no initial restriction on cocaine availability is that it was considered by prominent authorities to be a harmless tonic without any untoward side effects or after effects, if "used in moderation." As demand soared, pharmaceutical manufacturers rapidly increased production.[1] The initial wholesale price for cocaine hydrochloride was $15 per gram, but dropped within two years to a much lower figure, about $0.25, and thereafter generally followed the rate of inflation.

The early approval of cocaine gradually changed to concern and eventually to fear of its side effects on the mind and behavior of users. Medical journals and newspapers increasingly reported on persons whose careers and lives had been distorted and damaged by inordinate use of cocaine. In Connecticut, for example, a newspaper report of 1896 stated that cocaine was in more common use than tobacco in a local textile mill.[2] During this rising public concern, the Connecticut State Medical Society established an *ad hoc* committee in 1896 to consider the problem of cocaine. The committee concluded that the problem of excessive and uncontrolled use arose from self-administration by patients, but that when applied by a physician in low concentration at the time of a surgical procedure, the drug was safe.[3] In 1905 Connecticut enacted a statute restricting cocaine to a physician's prescription but without limitation as to amount or purpose.[4]

New York State legislators also turned to the wisdom of health professionals as a defense against the cocaine problem. In 1907 Alfred E. Smith, then a member of the assembly, led a legislative attack on cocaine.[5] The subsequent Smith anticocaine law restricted cocaine availability to a physician's prescription and required recordkeeping. The law placed no restriction on the amount or purpose of the prescriptions.[6]

These steps, however, did not bring cocaine under control to a degree satisfactory to the public or legislature. Some physicians and pharmacists provided cocaine without the professional restraint anticipated by lawmakers. In spite of this liberality, cocaine was still being sold on the streets of New York. One loophole regarding possession without a prescription was addressed by an amendment in 1910.[7] Then, in 1913, after continued frustration over the the easy access to cocaine, an even stricter anticocaine law was passed with support from Smith, now speaker of the New York Assembly. This act imposed severe restrictions on the health professions as well as penalties for any "patient" having cocaine without a certificate of authorization provided by a pharmacist or physician.[8]

The final stage of control, limiting the freedom of the health professions in dispensing cocaine and ending any latitude in its possession, had been reached to the extent feasible in New York State. The following year, the federal Harrison Act would bring an unprecedented restriction of cocaine's availability to the entire nation. More than alcohol, even during a national campaign which would lead to Prohibition in 1920, cocaine stood

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out as a fearful substance almost universally condemned.

In 1906 the Pure Food and Drug act had required that the existence and amount of cocaine in over-the-counter remedies be revealed on the label, although the amount was unregulated.[9] Then, on 1 March 1915 the Harrison Narcotic Act came into force. It required that records be kept of all opiates and cocaine from the importer or manufacturer down to the patient's prescription. Unlike the Pure Food and Drug Act, it also limited the amount of opiates — while prohibiting any cocaine — in nonprescription remedies. The Act required that physicians prescribe these drugs only "in the course of professional practice" and "in good faith."[10] Coupled with state anticocaine laws, the high water mark of restrictions on cocaine in the first wave of cocaine use had been reached.

Eventually cocaine use faded in the United States. The gap between the beginning of the current wave of cocaine use, about 1970, and the waning years of previous use, the 1930s, was so long that the earlier experience has been, for all practical purposes, forgotten.

The current resurgence of cocaine led to calls for legalization in the 1970s on the basis of its apparent harmlessness, while in recent years legalization proposals have stressed the economic argument to reduce the profits from illegal cocaine sales. Legal cocaine, according to this reasoning, would undercut costs, eliminate turf-wars between rival drug sellers and reduce the economic motivation for enlisting new cocaine users. Some have suggested turning cocaine distribution over to health professionals, an idea that has echoes of the Al Smith law of 1907.

Methods

The object of this study is to estimate the illicit price of cocaine during what might be called the "medical" phase of cocaine control, in New York City, from 1907 through 1914 and to compare that price with illicit cocaine prices in the 1980s.

As a comparison for purchasing power, the average industrial hourly wage was chosen. This information was obtained from Department of Commerce records (see Sources).

To establish the lowest wholesale price of a gram of cocaine, information on wholesale prices of an ounce of cocaine hydrochloride was obtained from pharmaceutical journals and price catalogs of various manufacturing chemists (see Sources).

It has been difficult to discover examples of retail cost to consumers of a gram of cocaine purchased from pharmacists in New York City. No record of a retail sale was located and none was present at the Archives of the American Institute of the History of Pharmacy. Of course, there was no standard retail price for the multitude of independent pharmacies.

To estimate the illicit street price of cocaine, the New York *Times, Tribune,* and *Herald* for the period 1906 through 1915 were searched. The amounts given in grains were converted to grams. The cocaine, usually described as mixed with an adulterant, was sold routinely on the streets in envelopes or paper packets for 25 cents each.

Data for the range of cocaine prices during the period 1982-1989 were obtained from the Drug Enforcement Administration. The street prices are for a gram offered to the user as cocaine (see Sources). The figures for 1989 are for July-September.

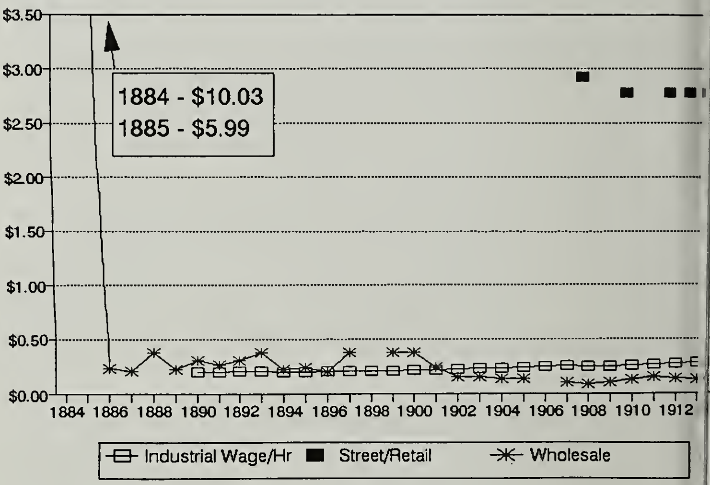
Results

1908-1914:

The wholesale price of cocaine in the earliest period, after a rapid fall from 1884 to 1886, settled down at a fairly steady level. Interestingly, the cost per gram at the wholesale level stayed close to the average hourly wage for industrial workers (Table 1). Also, the price, 25 cents, of the illicit street unit, or "deck," from 1908 until 1914 approximated the hourly wage.

Table 1

Price of Cocaine per Gram in NYC compared to Nat'l Industrial Wage/Hour



New York City street market prices for cocaine during the period before 1908 have not been located. Following passage of the Smith anticocaine law, prices began to be reported in the newspapers as arrests were made. The street or illicit price of a "deck" appears to have remained steady over the seven years between the Smith law and the coming into force of the Harrison Act, 1 March 1915.

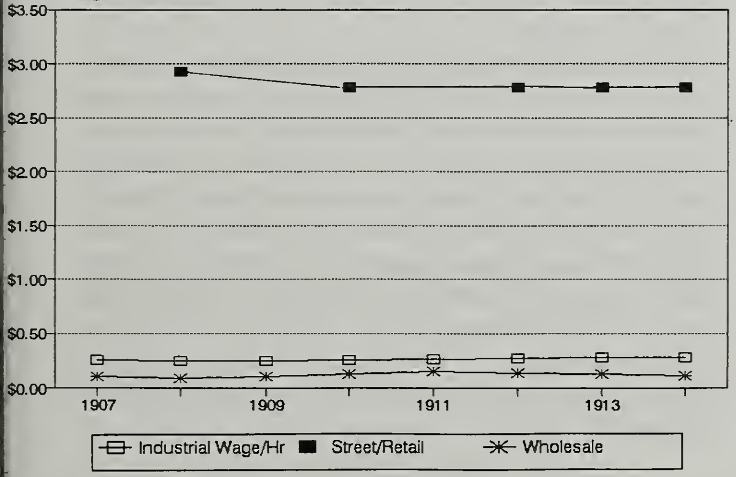
That the typical street unit was a deck for 25 cents is concluded from newspaper accounts. In one of the early arrests under the Smith act it was reported in the New York *Times* that a seller provided cocaine at the rate of 26 (sic) cents a package to "any one — man, woman or boy" (3 August 1908). The State Department report of 1910 also gave 25 cents as the typical package. The New York *Tribune* (2 December 1912) reported in detail the process of making "decks" to sell for 25 cents. The following year (10 November 1913) the *Tribune* reported more street sales at the rate of 25 cents each. In 1914 the *Tribune* reported the arrest of a cocaine dealer while weighing out 25 cent "decks" of cocaine (1 July 1914).

The amount of cocaine in a deck is estimated in the following way. In the federal government's report, "Opium Problem," submitted to Congress in February 1910, the amount of cocaine in an envelope is estimated to be "one to two grains" (65 to 130 mgms). The New York *Tribune* account of 2 December 1912 estimated the amount of cocaine in a "deck" to be 1.3 grains (85 mgms). This amount has been taken as a reasonable estimate of cocaine in the illicit street unit. The above references are used to estimate the cost of cocaine on the street market from 1908 through 1914 in Tables 1, 2, and 4.

The rate for a gram of cocaine on the street market would be about $2.75, eleven times the unit price and, for the period under analysis, about 10 times the average hourly industrial wage (Table 2).

Table 2

Price of Cocaine per Gram in NYC compared to Nat'l Industrial Wage/Hour



According to newspaper reports, a well-established illicit pricing scheme as well as profiteering organizations existed during the "medical" phase of control.[11]

1982-1989:

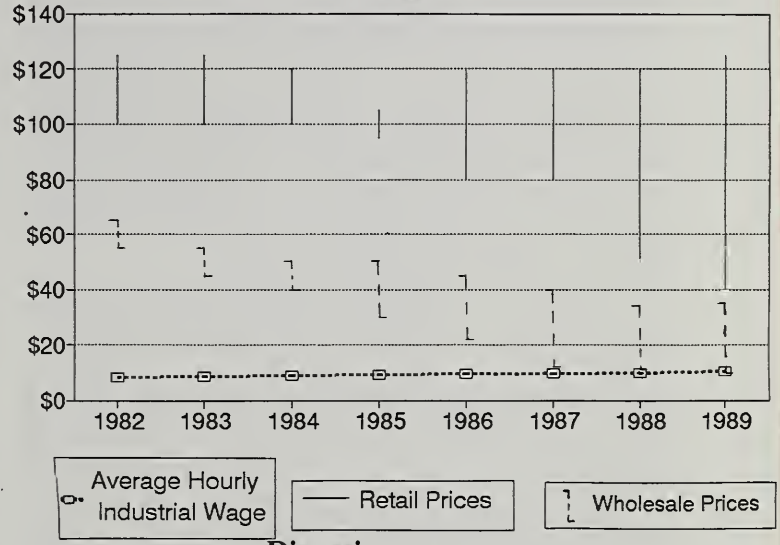
In 1982 the DEA began compiling statistics based on the sale of cocaine at the street level and also providing estimates of cocaine costs at higher levels of the drug trade.

The prices of bulk and street cocaine have been drifting down since the early 1980s. By now the street unit cost of cocaine — often stated to be between five and 15 dollars — approximates the average industrial hourly wage. The cost per gram on the street has declined from about 10 times to (if we take the lowest price reported by the DEA for 1989) about four times the wage level. The wholesale price of a gram of cocaine has levelled off during the last three years to near the average hourly industrial wage (Table 3).

The street costs of a gram of cocaine can be compared between the two time periods by dividing the hourly wage into the price. Table 4 shows that there is a striking similarity between the two eras with the exception that the cost of cocaine at the street level is now lower, in buying power, than it was on the streets of New York City prior to the Harrison Act and while the legal control of cocaine was vested in the judgment of health professionals.

Table 3

Cocaine Prices in the US
The National Range



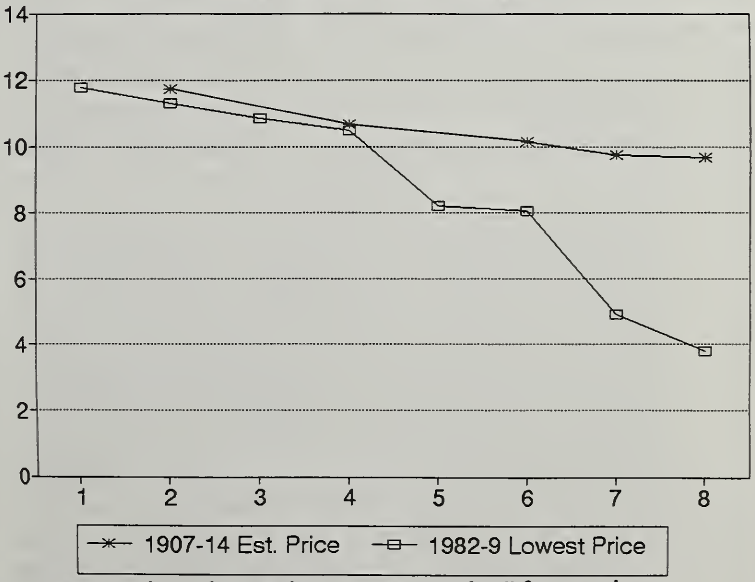
Discussion

Stable Illicit Market before 1914

Whether there was an illicit market for cocaine prior to the earliest state laws has not been determined. The prices in New York City found for the period 1907-14 were reported as a result of police arrests of illegal distributors, but prior to 1907 there were accounts of voluntary restrictions by local pharmacists and physicians.[12] Furthur research may clarify the question as to when an illicit market could be sustained because of the creation of voluntary restriction and the beginning of popular condemnation.

Table 4

Ratio Cocaine Street Price/Hourly Wage



The question of a previous "street market" for cocaine is significant because, if the assumptions about the cost and content of a "deck" are valid, there does not seem to have been a period of adjustment to market demand after the 1907 Smith law. The post-law market apparently maintained a fairly steady price for a "deck" of cocaine for nearly eight years.

The existence of this illicit market while the regulation of cocaine was turned over to the judgment of physicians and pharmacists suggests that this measure did not affect the supply or the availability of cocaine outside professional distribution. A gram of cocaine continued to cost on the street about ten times the average industrial hourly wage, a multiple as high or higher than cocaine has cost on the street since 1982. In this regard, it is not unreasonable to conclude that syndicates which provided illicit cocaine before the Harrison Act had profit margins comparable to our own day.

One of the most interesting comparisons between the pre-World War I unit price on the street, 25 cents, and the more recent street unit prices, five to 15 dollars, is their coincidental similarity to the hourly wage. Perhaps the wages for an hour's work is a natural market rate for the street unit. Until the Harrison Act, the United States had no national uniform law for the legal distribution of cocaine. That the street price in New York City could be maintained at such a high level before the Harrison Act is further evidence that reliance on health professions failed to eliminate an illicit market.

The reasons for this failure are several. Visits to a physician were assumed to keep access to cocaine under the watchful eye of a professional who could, if needed, treat a patient's cocaine problem. This requirement, however, would add the cost of a physician's visit to the cost of cocaine from a pharmacist. Also, drug users may have had a disinclination to become involved with formal and offical suppliers then as now. Whatever reasons one might want to assign, the hurdle presented by professional contact and record-keeping was apparently sufficient to maintain a stable illicit market in cocaine. Significantly, this illicit market was sustained in the face of some health professionals who prescribed and dispensed liberally, literally selling prescriptions to all comers.

There is evidence that the price of cocaine after World War I was much higher, even taking inflation into account, than in the era before the Harrison Act.[13] An important component of this rise in price and gradual decline in demand is the prolonged length of time required for the shift in consumption pattern. If we assume the time required now for a change in popular demand for cocaine may be roughly similar to the time taken for the previous episode, the curve in the cocaine price has been the opposite in each era. The shape of the price curve over the earlier wave of cocaine use resembled the shape of a "J" (extending the price curve into the apparent rise after World War I), and, while the current price curve is incomplete, we know that the recent curve has been the very reverse of that before 1915, starting high in the early 1970s and going lower. It will be interesting to see whether we are in a trough which will begin to rise and form a "U" shape, or whether the decline of cocaine prices will continue. If the condemnation and reaction against cocaine continues, it is possible the price will rise as a reflection of domestic restrictions, both social and legal, as it did after the anticocaine consensus established 70 to 80 years ago.

The Timing of Anticocaine Laws

Unlike our current cocaine episode which began about 1970, laws were not in place during the earlier "epidemic" until the public and legislators demanded controls. Escalating legal severity after 1907 in New York State and the rest of the nation paralleled popular opinion. A report that President Taft transmitted to Congress in 1910 described cocaine as "more appalling in its effects than any other habit-forming drug used in the United States."[14] A further reflection of fear of cocaine is that the section of the Harrison Act of 1914 that permitted some opiates, even heroin, in over-the-counter remedies, allowed no cocaine.

The contrast between attempts to control cocaine in the two waves of use is striking. Even after the substantial decline of cocaine use by World Wae II, increasingly harsh penalties for cocaine use were placed on the statute books.[15] These laws created a dramatic disparity between the fairly relaxed attitude toward cocaine in the mid-1970s and the severe penalties. The conflict between severe laws and widespread toleration of cocaine use meant that we experienced about 15 years of additional controversy over cocaine and controls until a consensus was once again established against the use of cocaine in the mid-1980s.

In this second cocaine era we have had anticocaine laws from the beginning of its renewed popularity and availability, whereas cocaine use during last century began in the absence of laws restricting it. After 1884, only as cocaine use continued and its damage was seen, did laws against the drug begin to be enacted and gradually strengthened. Since 1970, in contrast, the extended controversy over controls on cocaine — the prolonged disharmony between anticocaine laws on the books and more tolerant public attitudes — may be reflected in the frustration that has led to calls for drastic measures on opposite sides: those who propose legalizing cocaine believe it is time we all admitted to 20 years of failure in controlling it, while others call for draconian penalties which aim sharply and quickly to curtail drug use through punishment. The quest for a simple answer to the drug problem does not take into account the gradual fall in demand for cocaine that, at least in the past, followed the establishment of a popular anticocaine attitude. The decline phase may last 15 to 20 years. Reasonable policies might not appear effective as quickly as the public wishes, but impatiently rejecting these measures for extreme criminal justice measures will flood courts and jails, sponsor extravagant interdiction methods, and lead to a psychology of scapegoating foreign nations and domestic groups, such as the inhabitants of the inner cities — all without substantially affecting the rate of decline in cocaine use.

On the other hand, this study suggests that anything less than open access to cocaine, even the apparently liberal public health position of turning over responsibility to the flexible judgment of physicians and pharmacists, will support an illicit market with prices comparable to those in our own day.

The Cocaine Quandary

The public faces the quandary of fearing cocaine too much to allow open access, but being outraged by the corruption and profits that are products of the illicit trade in drugs. In the previous wave of drug use this cocaine impasse was resolved by an almost total elimination of the demand for cocaine through public experience with the drug and its users. In spite of profiteering in the illicit market, cocaine eventually faded away in the United States. This awareness of cocaine's danger was not effectively passed on to later generations — although severe penalties did persist — and by 1970 cocaine reappeared in the United States as fresh and exciting, an apparently useful tonic, stimulant, or ideal recreational substance.

The period of cocaine's availability after the mid-1880s and before action began to be taken against it, about 20 years, and the stage of increasing control, about 10 more years, followed finally by about two more decades while the problem subsided, suggests that cocaine use is not quickly corrected by simple, dramatic actions. Neither reverting to free access, the very condition that brought demands for control, nor a simple reliance on punishment offers hope for a speedy solution.

Sources

I. Cocaine Prices in the US:

1884: the price quoted represents the average of the prices reported in the *Druggist Circular* of December 1884, p. 177 ($.50-$.80 per grain).

The Medical Record 22 November 1884, p 578: price of cocaine up to $.50/grain.

1885: the price quoted represents the average of the prices reported in the *Chemist and Druggist* of 15 April 1885, p. 221 ($.30-$.50 per grain).

1886-1887: the price quoted represents the average of the prices reported in the *Proceedings of the American Pharmaceutical Association* 35:397 (1887).

1889: price is quoted from the Annual Catalogue (1889-90) of the Meyer Brothers Drug Company of St. Louis (Collection of Mr. William Helfand, New York, NY).

1891-1915: except for 1886, 1898, and 1906, are quoted from the following issues of *Merck's (Monthly) Report* (courtesy of Mr. Jeffrey Sturchio, corporate archivist, Merck & Co., Rahway, NJ): December issue of 1891, June issues of 1892-1894, April issue of 1895, June issues of 1896-1915. The quotation for 1896 is from the catalogue of the Cooke, Everette and Pennell company of Portland, Maine (collection of Mr. William Helfand).

1888, 1890, 1893, 1897, 1899, 1900 — these quotations are taken from the catalogue of Peter Van Schaak & Sons, Chicago (courtesy Dr. Gregory J. Higby, The American Institute of the History of Pharmacy, Madison, WI).

1901 — from the catalogue of McKesson and Robbins, New York (American Institute of the History of Pharmacy).

Prices for 1898 and 1906 have not been located.

II. 1982-1989: *The Illicit Drug Wholesale and Retail Price Report.* United States Department of Justice, Drug Enforcement Administration, Strategic Intelligence Section of the Office of Intelligence. The data in these reports derive from DEA case studies, DEA Quarterly Progress Reports or Field Management Reports and "street studies" supported by the DEA and the National Institute on Drug Abuse or "liaison with Field Intelligence Groups." Prices reported from all areas are used to determine the national average, but selected cities are also available to represent the price range. "Wholesale" prices are those paid by both high and mid-level dealers, while "retail" refers to the price at which a street dealer sold the drug.

III. Average Industrial Hourly Wages:

1890-1926: these figures are quoted from *Historical Statistics of the United States: Colonial Times to 1975,* p. 168, Series D 766.

1965-1987: these figures are quoted from the *Statistical Abstracts of the United States published in the following years:*

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"current prices" for 1966 and 1967).

1975, p. 366: no. 594 (Manufacturing)
1977, p. 413: no. 668 ″
1980, p. 421: no. 699 ″
1982-83, p. 401: no. 665 ″
1985, p. 417: no. 694 ″
1988, p. 392: no. 646 ″ Preliminary
1989, p. 404: no. 661 ″ Preliminary

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2. Ansonia *Sentinel*, 29 December 1896.
3. Report of the Committee on Matters of Professional Interest in the State. I. Cocaine. *Proceedings of the Connecticut Medical Society. 1896;253-64.*
4. Connecticut Public Acts, 1905, Chapter 127, "An Act concerning the Sale of Certain Narcotic Drugs."
5. *New York Times,* 21 February 1907, p. 4, col.4.
6. Laws of New York, 1907, Chapter 424, "An Act to amend the penal code, in relation to the sale of certain drugs."
7. Laws of New York, 1910, Chapter 131, "An Act to amend the penal law, in relation to the sale of cocaine and eucaine."

8. Laws of New York, 1913, Chapter 470, "An Act to amend the penal law, in relation to the sale or possession of cocaine or eucaine."
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10. Musto: *American Disease*, p. 121ff.
11. For example, "Police Blind to Cocaine Selling" p. 1, and "Gangs of Gunmen Protect Sellers from Competition" p.2, New York *Tribune* 2 December 1912.
12. Musto, op cit, p. 14ff and Ansonia *Sentinel*, loc. cit.
13. For example, New York *Tribune*, 28 July 1921 ($1.50/deck) and New York *Times*, 4 January 1923 ($2.00/deck).
14. Opium Problem, Message from the President of the United States: Senate Document No. 377, 61st Congress, 2nd Session, Washington, DC, Government Printing Office; 1910: p. 48.
15. Musto, op cit p. 230ff.

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50 Years Ago

From the *Journal of the Connecticut State Medical Society*

June 1940

The God of War Calls

The Medical Reserve Corps is calling attention to the reserve commissions available to physicians under 35 years of age and well it may. There still lingers among those of the profession in the next older generation an antipathy to all that reminds of war, whether it be due to memories of French mud, English fog or countless hours of waiting in debarkation ports. The Army must be supplied with adequate medical talent and to this group of younger men it now appeals.

Just what tomorrow holds in store for our nation we cannot foretell but one fact is now assured, we must be prepared, and in that preparation the doctor has a place. Should another epidemic surge across the continents of the world such as visited the United States in the late summer and early autumn of 1918 it would be needlessly tragic to repeat the situation which existed at that time when so many towns and cities suffered from lack of good medical care because the ranks of those practicing at home were thinned to the danger point by war. Some such plan must be evolved in this country as now exists in England where a Central War Committee representing all branches of the medical profession has been set up under governmental plans. To this committee the government refers all questions regarding the supply of medical personnel arising out of the war. It satisfies the demands for this personnel, both for the civil population and for central and local government authorities. Local medical war committees scattered over all England are consulted by the central committee before a practitioner is allocated for national service, thus enabling the maintenance of a sufficient quota at home according to the density of population and proportion of physicians practicing in any area. Specialists are allocated in the same manner, qualifications and experience being investigated before appointment. No practitioner is allocated to the services without his consent.

With the lowering of the mortality rate throughout our nation, it is only to be expected that in the event that the present European war engulfs us in its tide more attention by the Medical Corps will be given to prevention of disease in the Army. New advances in chemotherapy may yield large returns. Canada is planning to give every Canadian soldier wounded in battle an injection of sulphanilamide at the earliest possible moment. Blood transfusions and early closure of wounds will play a major role in the present conflict. Blood banks bid fair to become a standard equipment in base hospitals. Already the entire Canadian army has been inoculated with tetanus toxoid. We find the medical profession and the army medical services of Canada working in close cooperation. As in England, no communities will be stripped of physicians and no physician will be named to important army posts on military qualifications alone. The Medical Corps of the U.S. Army has a full sized task ahead. There should be many trained physicians ready and waiting to accept reserve commissions.

— Editorial from the *Connecticut State Medical Journal*, June 1940.

Children in Crisis: A Role for the Physician Caring for the Poor

Some Personal Observations

LAWRENCE C. KLEINMAN, M.D.

THE United Nations Children's Fund offers statistics which indicate that worldwide 40 thousand children die each week as a result of poverty. The vast majority of those deaths occur in developing nations. But one does not have to look beyond our borders to find children ravaged by poverty.

I am stirred by what I see. As a pediatrician at an urban community health center, I witness daily the pain which poverty inflicts upon children and their families. I share the incomprehension of the 14-year-old rape victim who struggles to understand how to cope with a one-year-old son, the product of that rape. I sympathize with the reasoning of family after family who will not report health violations in their apartments for fear that to do so would leave them homeless.

As a young physician searching for role models of physicians dedicated to the service of those in need, I have noticed that physicians vary greatly in how they approach the poor. Many physicians do make significant contributions by trying to decrease the suffering of all their patients. For example, Dr. Philip Porter created a system of school-based clinics which serve the children of Cambridge, Massachusetts, including many who previously had not had access to health care; his system has become a model for other cities across the country. In fact, the American Academy of Pediatrics is now using his Healthy Children program as part of its efforts to improve access for children to health care in communities across the country. This is an excellent example of how local activism can have far reaching benefits; the Academy provides the role model of an established medical society lending its weight and its prestige trying to improve the public health by advocating for the needs of the poor.

I am saddened that there are other physicians who dismiss their poor patients as being somehow lesser human beings: I have heard the terms "dirt bag" and "dirt ball" used to describe destitute patients or substance abusers at medical centers in various regions of our country. The dichotomy between "service" and "private" patients is being translated into different attitudes towards each class. We must demonstrate by our behavior—and our graduate educational system must reinforce—that such thinking is not acceptable.

Other physicians withhold their professional services from patients who are unable to afford necessary medical care. I recently called a surgical specialist's office to refer a child in need of his services. The child was on Medicaid. I was informed that the doctor would consider taking the case only if he found the "pathology" of interest! While I sympathize with the needs of the physician as a small businessman, this physician is a member of a high-paying specialty. Indeed almost all physicians are members of a financial and educational elite. Public funds have supplemented the education of all of us. It is our responsibility as professionals to serve; we need to lead by our example. It is our priviledge to be remunerated as we are for our services; it is not society's obligation.

The poor are often thought of as comprising a homogeneous group—people who have chosen to be on welfare rather than to work. They are perceived to be guilty of missing some vital element or quality that would make them appropriate for general society. The statistics belie this perception. *The Changing World of Connecticut's Children* (Connecticut Commission on Children, 1987) is a government publication which describes the outlook for children in our wealthiest state: it points out how the economic and demographic changes which our society is undergoing have created a bleak outlook for the future of children which can only worsen unless we reprioritize

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LAWRENCE C. KLEINMAN, M.D., Assistant Clinical Professor of Pediatrics, Yale University School of Medicine; Clinical Instructor in Pediatrics, University of Connecticut School of Medicine; Director, Pediatric Services, Bridgeport Community Health Center.

public policy in favor of children, families, and human services. Increasing numbers of the poor and the homeless are children. Many heads of households are working full time but not earning enough to feed, clothe, and house their children, not to mention to obtain appropriate medical services. Nationwide, one third of the homeless are families with children. Government figures indicate that over 37 million people do not have health insurance. Many of these are working families; regardless of their income, these families are within one illness of complete poverty. I will try to illustrate the impact of poverty on three children who were seen during a single week of my practice in Bridgeport, Connecticut. Then, I will suggest how we as physicians can attempt to interrupt the cycle of poverty.

First, I would like to describe the case of Roberto. Roberto was a two-year-old boy who lived with his mother, his five siblings, his aunt, and her three children in a four-room apartment. The two mothers were overwhelmed by the task of caring for nine children under six years of age in an apartment designed for two adults only. Also living in this apartment were many rats, each about a foot in length. Unlike the children, the rats seemed comfortable in this environment. They did not run when approached. They sauntered through the kitchen or the bedroom at their pleasure. They climbed the skirts of Roberto's mother. She slept with Jonathan, her two-month-old son, in her bed to protect him from the rats. Unfortunately, she was not able to protect Roberto as well. Roberto was bitten by rats on his ankle, both hands, his ear, and his left eyelid. Three of his fingers were so infected that he was required to be in the hospital receiving intravenous antibiotics for more than a week. The city's health and housing departments offered to fine the landlord if he would not fumigate within a week; that is the extent of their authority. The social workers informed me that they were searching for alternative housing, but that the market was very tight. They also confirmed what Roberto's mother had told me: the landlord owned a refurbished building in the neighborhood. It remained empty because he had not found the "type" of tenants he was looking for. Pressure was brought to bear to have him make an apartment available to Roberto's family. In the mean time, Roberto sat in the hospital and his family fought the rats for control of the apartment. Currently, Roberto and his immediate family live in another of their landlord's buildings. His aunt and cousins were turned out of the apartment by the landlord. In addition, Roberto and three of his siblings required treatment for iron-deficiency anemia. The rats in this apartment are smaller and less aggressive than those in the previous one.

My second case is that of Anna, a four-year-old girl who came to my office for a routine physical exam. As part of the examination, I noticed that she had a bruise at the entrance to her vagina; this almost certainly means that she had suffered sexual abuse. I spoke with Anna and her mother in some detail. Her mother explained that about one month earlier Anna had complained that a fifteen-year-old girl, a neighbor, had touched her sexually. Mother thought the genitalia looked unmolested and thus dismissed the complaint. I explained that sexual abuse often left no physical evidence and that children do not just make up these complaints. She burst into tears. She had wanted to believe her daughter; she was concerned about Anna's welfare. But the fifteen-year-old was the landlord's daughter; Anna's mother dared not say anything to anyone. Instead, she had tried to keep the older girl away from Anna. Anna confided that she thought the fifteen-year-old was nice to her, even though she molested her. "She gives me candy," explained Anna. When I asked her when she last had been molested, she replied simply, "Yesterday."

Six months later, I again found Anna to have fresh vaginal trauma. It appeared that this was inflicted upon her by her stepfather. It is now not clear whether he was the actual perpetrator of the initial sexual assault on this four-year-old child.

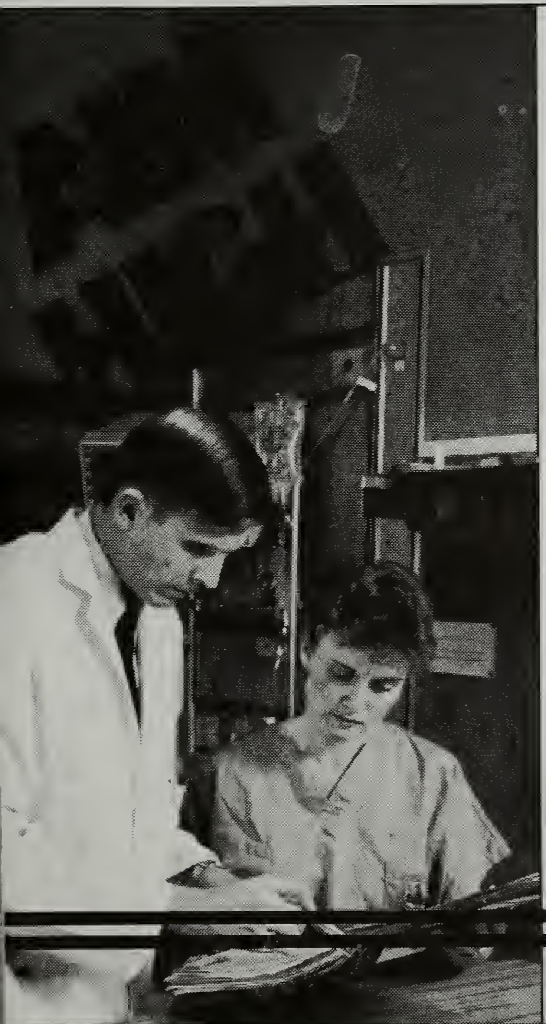
The third case has a happier ending. Iris is the mother of three school-aged sons. They live in the same neighborhood as Roberto and Anna; I had helped her in the past to obtain needed food and clothing. Iris brought her son, Joseph, to see me. Joseph had returned home from school six days earlier with bruises all over his body. He could not or would not explain to his mother how he had gotten them. She took him to school the next day to demand an explanation for the bruises from the principal. Not satisfied with his answers she reported the school to protective services. The principal, upon seeing the boy, had reported Iris to the same agency. They, in turn, suggested that she see me. Joseph did appear badly beaten. However, laboratory tests revealed that Joseph was recovering from a benign, disease idiopathic thrombocytopenic purpura. In fact, he had not been beaten; the bruises came from normal activities. The delay in seeking medical attention actually had spared Joseph the need for a bone marrow examination, a test which is expensive, very painful, and would have required a referral to a pediatric hematologist. Thus, on the basis of a simple blood count (and follow-up counts), I was able to reassure Iris, the school system, and protective services. And Iris and her sons returned to the poverty in which they live.

This last is as happy a tale as I can tell about my patients. For these children, this is as well as the system works. The families of children like Joseph, Roberto, and Anna remain anonymous victims—until they become statistics.

As physicians we are among the few in our socioeconomic class to be directly exposed to the suffering which poverty inflicts upon our fellow human beings. I call upon my fellow health-care professionals to become involved with this suffering. Provide service to those who need it. Don't leave your patients' pain at the office, but rather share it with your spouse, your colleagues, your friends, and your elected representatives. Tell of the real people who suffer as a result of misdirected budget cuts and failed social and economic policies. If you become involved, I am convinced that you will grow incensed that our affluent society produces such poverty. Give outlet to that rage in the form of political and social action.

It is only through a concerted advocacy effort that we can hope to offer young parents an environment in which they can nurture their children. If we want these children to grow to be productive members of our society then we must see that these families have safe and clean housing, adequate food, and a decent education. We are not as insulated from the effects of institutionalized poverty as we let ourselves believe: the brutal and senseless slaying of a vital pathologist in her office at Bellvue, and the equally atrocious rape and attempted murder of an investment banker as she jogged in Central Park can both be traced to the failure of society to provide for its underclass. These crimes are not excusable; they are part of an epidemic of violence which is one result of a devaluation of life on the streets. We treat the victims of drug related shootings in adult and pediatric emergency rooms every day. We are frightened by reports of teenage gangs terrorizing the urban landscape. As physicians we are able to recognize that this violence is not random, that it has a definable epidemiology. These types of attacks are predictable; they are also preventable. Tragedy will continue to be added to tragedy until we improve the fundamental quality of life for society's poorest. Physicians can play an important role in improving the quality of all our lives.

I call upon my fellow physicians to lead the struggle to make this a kinder and gentler nation in the reality of the ghetto and in the barrio. Let us not permit poverty-dependent deaths of children or of anyone in these United States. We physicians are in a unique position to be able to lead such advocacy efforts. We are at the interface between society and its underclass: our patients trust us and we have access to the power centers of our communities. Let us be advocates for those patients who need our help the most; our efforts in our communities can be the difference between life and death. The need is manifest. The time is now. The opportunity is ours.



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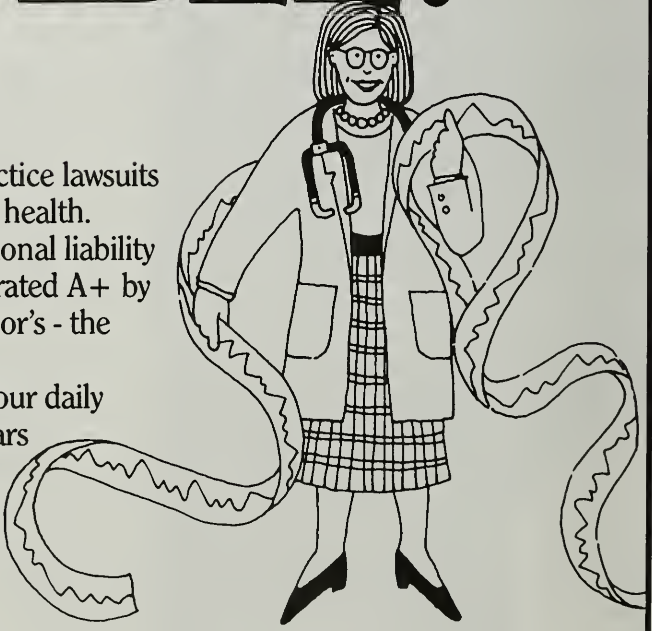

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The Evolution of Editorial Peer Review

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Practically no historical accounts of the evolution of peer review exist. Biomedical journals appeared in the 19th century as personal organs, following the model of more general journalism. Journal editors viewed themselves primarily as educators. The practice of editorial peer reviewing did not become general until sometime after World War II. Contrary to common assumption, editorial peer review procedures did not spread in an orderly way; they were not developed from editorial boards and passed on from journal to journal. Instead, casual referring out of articles on an individual basis may have occurred at any time, beginning in the early to mid-19th century. Institutionalization of the process, however, took place mostly in the 20th century, either to handle new problems in the numbers of articles submitted or to meet the demands for expert authority and objectivity in an increasingly specialized world.

THE peer review process has been essential to science and medicine for at least two generations. Peer review in publishing has created standards in biomedical and other scientific communities, and peer review of grant applications—or merit review, as the National Science Foundation now refers to it—has determined the allocation of billions of dollars devoted to research. It is a scandal that substantial histories of either kind of peer review do not exist.[1]

It is only fair, therefore, to note that what I am going to say about the period since 1800 represents substantially a pioneer effort. Nevertheless, even a partial history and preliminary synthesis is sufficient to suggest some of the issues in peer review that time has tended to hide as researchers and editors have developed the present institutions.[2] Not least revealing in this history is the fact that it concerns not only why peer reviewing developed but also why, when it might have, it did not. For my findings include two counterintuitive conclusions. The first is that grant peer reviewing and editorial peer reviewing developed independently and, as far as I can determine at this point, had no influence on each other. The second counterintuitive finding is that editorial peer reviewing did not evolve as a movement spread from one journal to another but, rather, in a much more disorderly way.

History of Medical Journalism

These conclusions emerge from evidence that is scattered at best. For investigators working on the history of editorial peer review are not only trailblazers but have a further disadvantage: they are operating in the still substantially unexplored field of the history of medical journalism. In 1962, Morris Fishbein, longtime editor of *The Journal of the American Medical Association,* recognized the need for a history of medical journalism. "The time is truly ripe," he asserted, for someone "to write a real history of medical journalism throughout the world and to recognize the part which it played in the great changes that have occurred, not only in the science of medicine and in its practice, but in its relationship to society."[3] In the quarter of a century since he wrote his plea, no one has written such a history or anything like it.

Historians have good reasons for their reluctance to work on the history of medical journals. Few records survive other than the published journals themselves. In contrast to other areas of biomedical history, which are illuminated by records of laboratories and clinical practice, good records of the editorial processes of medical journals from any period before World War II either do not exist or have not yet come into the hands of historians.[4]

Altogether, then, scholars have not provided much research that might undergird a full survey of the history of the narrower topic of editorial peer review. Nevertheless, fragmentary items that have appeared or have survived permit some glimpses into the evolution of the peer review process in the editing of biomedical journals. I offer now the results from such material as I could uncover.

Obviously, two traditions contributed to the present institutions. One was the editing of scientific journals. The other was the editing of medical journals. David

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Kronick[1] has described the development of journals of both kinds in the 17th and 18th centuries and the variety of editorial procedures that appeared. During the early decades of the 19th century, the starting point of my narrative, the distinction between scientific journals and medical journals, as categories, developed fairly clearly, however much the distinctions sometimes blurred in practice.

Nonmedical Journalism as a Model

The medical journal came into existence during the 19th century just as personal journalism was flourishing in general magazines and newspapers. One of the models for medical editing was, therefore, the crusading newspaper writer or, at the least, the publication that was a personal vehicle for the editor. In this tradition, the editor took on overwhelming importance in the history of the journal. Moreover, this distinctive function of early journals as personal mouthpieces caused them to flourish in great numbers, because there were many physicians who had viewpoints and causes. John Shaw Billings, in 1879, thought that it was "as useless to advise a man not to start a new journal as it is to advise him not to commit suicide." As people at the time observed, quantity, not quality, was the mark of medical journalism.[5]

Much of the published history of medical journalism has indeed focused on crusading and colorful editors. Perhaps the best known was Thomas Wakley, the founding editor of the *Lancet*.[6] The basic affinity of medical with general journalism was therefore often all too obvious during the 19th century. Henry Maunsell, for example, was a physician who was collaborating founder of the *Dublin Medical Press* in 1839. Later, he also purchased a regular city newspaper, the *Dublin Evening Mail*, which he owned and edited for almost 20 years.[7]

However, the general magazine and newspaper model left other marks on medical editors beyond the tradition of reform. As the 19th century proceeded, newspapers increasingly came to carry news as well as opinion. So, too, did medical journals come to resemble newspapers in this additional respect. The resemblance appeared in appointing correspondents to cover medicine in different geographic and specialty areas. The resemblance appeared in struggles of editors to obtain society proceedings and other accounts of medical meetings for their columns. The resemblance appeared in widespread borrowing and copying from other journals, just as was the practice among editors of general magazines and newspapers. (Curiously enough, borrowing material from other journals soon operated as a kind of implicit, if informal, peer review process, for very good articles were reprinted in many periodicals that were edited by a variety of peers.)[8]

The newspaper model, with a strong editor who needed material to fill the journal, had no place in it for any peer review process. Indeed, in some medical journals, the editors wrote much or all of the content and did not copy from elsewhere, and they had no real opportunity or motive to consult other opinions. Editor-centered medical publication, therefore, inhibited the introduction of peer review.[9]

In some parts of the world, well into the 20th century, medical journals continued to follow the lay journalism pattern. Such was the case not just among weak publications in the United States or the British empire; French medical editors usually considered themselves to be journalists, even reporters, and spoke of their work in such terms far into the 20th century.[10]

Specialization

In addition to those journals that followed the newspaper model, another type of medical and scientific periodical existed: the official publication of a continental research institute, typically a German academic institute specializing in one kind of research. However, it, too, did not generate any occasion for peer review assistance to an editor. In the institute publication model, the university professor was also the director of the institute, and the journal existed primarily as the organ of the institute to publish the research done there. Since the editor was the great expert in the subject matter to which the institute devoted itself, obviously no outside referees were needed to judge the merits of articles.

Another aspect of the institute publications differentiated them from those in the journalistic tradition. Typically, such publications were like the 18th-century journals that Kronick has described in that they did not have to appear at any particular time. Rather, the editor could just wait until enough articles accumulated before issuing a new number. Unlike commercial journal editors, for example, they were under no pressure to fill a number by a deadline.

The institute publications edited by the expert professor-director did embody one of the major changes that later brought peer review, namely, specialization. Peer reviewing, in fact, developed in situations in which an editor or editors lacked the specialized knowledge that would have permitted them to make decisions about highly technical articles.

Specialization at first, however, did not in itself often lead to systematic referring out of articles in either medical or scientific journals because in virtually every case an editor of a specialty journal was fully expert in the entire specialty covered by the journal and perceived no need for outside consultants. Indeed, in medicine, at least, the appearance of a journal was usually the first sign of the existence of a specialized field of interest—even before there were formal organizations to confirm specialists' mutual affinities. In the early years, specialty journals, like journals in general, were often also instruments of personal journalism, but in this case the personal journalism was devoted to furthering the development of a specialty area.[11]

By 1905, the founding editor of *Surgery, Gynecology and Obstetrics* could write candidly: "...specialists, for whose success is required the highest adaptability for their calling, combined with the cultivation of technique, the scientific spirit, and the highest industry and experience, should have a direct supervision of the contributions to the literature pertaining to their own work. Hence practical surgeons, gynecologists, and obstetricians will direct editorially the trend of policy of SURGERY, GYNECOLOGY AND OBSTETRICS." To "direct editorially" of course meant in practice that in-house staff of the journal would carry out the equivalent of peer reviewing. Since 11 distinguished specialists acted as members of the "editorial staff," plus the managing and associate editors, authors in *Surgery, Gynecology and Obstetrics* were in effect subjected to substantial refereeing by specialist-experts.[12]

Scientific and medical editors surrendered to the forces of increasing specialization of knowledge only piecemeal and unsystematically. Stray instances appear here and there in the literature in which an editor, rather than the author, referred an article out for expert opinion. One of the early famous instances, for example, came in 1871 when Yale University geologist James Dwight Dana, editor of the *American Journal of Science* sent an article on physics by Henry A. Rowland out to two colleagues at Yale, who recommended against publication; meantime, James Clerk Maxwell saw merit in the article and had it published in the prestigious *Philosophical Magazine*, to Dana's embarrassment.[13] However, increasingly the fragmentation of knowledge kept in editor's chairs the people who believed that they had the competence to judge articles within the subject matter that the journal covered. Smith Ely Jelliffe, for example, who owned the *Journal of Nervous and Mental Disease* for much of the first half of the 20th century, and who was in fact something of a polymath, would not admit that he lacked authority in even the subfields of neurology and psychiatry until very late in the 1930s when his editorship was nearing an end.[14]

Specialization and the Defintion of Peer

There were, therefore, no particular periods before World War II when large numbers of biomedical publications began to have recourse to peer review to cope with the problem of specialization. As the 20th century advanced, however, as Harry M. Marks points out, the specialist element in peer reviewing took on a new aspect. People became specialists not just in subject matter but in terms of technique and, especially, in medicine, laboratory materials. Expertise, thus, was limited in many cases to just a few research sites, and even experts outside those communities were no longer peers as such; instead, expertise came to be based solely on membership in a very limited community indeed, again raising the question of the extent to which any given referee who might have general rather than very specific expertise would be doing "peer" review any more than was done by the old generalist editors.[15]

Peer Review Not Spread as a Technique

Not only were there no special periods when peer review techniques came in, then, there were no systematic patterns in the way in which various editors responded to the proliferation of specialties. I have found no particular evidence that the technique of referring articles out spread, for example, as a surgical technique might spread from one practitioner to another or from one medical center to another. Quite the opposite: each editor or group of editors devised ad hoc procedures, right up to the 1940s. Indeed, there is one notorious instance in which medical editors did *not* follow a clear model of peer review.

In 1893, Ernest Hart, editor of the *British Medical Journal*, addressed the meeting of the American Medical Editors' Association in Milwaukee, Wis. Hart told this substantial assemblage of editors of the bulk of leading US medical journals that times had changed since he, as a young resident, had composed columns on a variety of subjects for a leading medical journal. Any such system, Hart said, had been abolished 20 years before at the *British Medical Journal,* and there had for some years been a new one[16]:

> The only system that seems to me adequate to the real needs of professional readers is that in which every unsigned editorial paragraph is written by a specially selected expert. That is the principle on which I have modelled the journal I have the honor to conduct. Every letter received, every paragraph, every cutting editorially dealt with, is referred to an expert having special knowledge and being a recognized authority in the matter.... It is a laborious and difficult method, involving heavy daily correspondence and constant vigilance to guard against personal eccentricity or prejudice or—that bugbear of journalism—unjustifiable censure. But that method may, I venture to think, be recommended as one that gives authoritative accuracy, reality, and trustworthiness to journalism. A medical journal, in order to rise to the height of extended usefulness, needs to be written from end to end by experts; and so far as the [*British Medical Journal*] may be considered to have been a success, that success, has, I believe, largely been due to the fact that no pains or necessary outlay has been spared to provide that every line in every department shall be written by persons who are themselves trustworthy experts....

It is hard to imagine a more definitive description of how specialization could, and presumably should, affect medical journal editing. Yet the published papers and proceedings of the organization that Hart addressed, the American Medical Editors' Association, reveal no evidence that peer reviewing was ever subsequently an issue among the editors or that such a procedure even existed, nor are there other statements that might suggest that medical editors heard Hart's message. Clearly, in this case as in others, the technique of referring to experts did not spread as a technique from person to person by emulation.[17]

Resistance to Peer Review

Beyond the pervasiveness of personal journalism, there were several additional reasons why editors of medical periodicals, in particular, did not adopt peer reviewing of manuscripts even if they heard about it.[18] First and foremost was the continuing problem that editors could not fill their columns. Their problem was finding barely publishable manuscripts, not turning down original contributions. As Billings noted in 1876, "At the present day, the demand for brief papers and reports of single cases, exceeds the supply. The weekly and monthly periodicals are omnivorous and insatiable in their requests for contributions." As late as 1921, C. Stanford Read, editor of the British publication, *Journal of Neurology and Psychopathology,* was complaining to a colleague about the difficulties of getting enough material to fill the pages of his journal.[19]

Another objection to peer review, in the United States especially, arose because much opposition to specialization existed as a matter of principle, and in medicine, editors insisted that anyone who possessed the MD degree by virtue of that qualification had no reason to defer to any colleague as an expert greater than he or she. To do so was to be less than a complete physician. Insofar as peer reviewing represented the authority of the specialist, then, many editors resisted it. As one American editor commented, "I would rather have twenty articles from country doctors on my desk than twenty articles from the learned specialist of the city..." on the basis that practical experience was what medical journals should describe.[20]

Editors of journals that served as organs for organizations had particularly great difficulty with the democracy of the profession. Every member of the organization assumed that the journal had to print anything that the member might have presented or sent in. Where proceedings were carried, it was almost impossible for editors to prevent the publication of some materials, including articles by ill-educated, "unscientific" colleagues. The clash between organizations and editors over the "right" to publication was a constant problem.[21]

In some cases, the decision to favor representation over quality was a conscious one.[22] However, editors who made such decisions also had in mind another item among the medical (as opposed to the scientific) editors' concerns, namely, the role of the editor as educator through his or her journal. Indeed, in pursuit of their educational role, many journal editors of the 19th and 20th centuries actually printed didactic medical school lectures. This theme of the editor as an educator appeared consistently when editors of personal journals made statements about their work. They were concerned not only to educate their readers but also their contributors, whom they asked to pay regard to bibliography, expression, and logic when revising their submissions. Altogether, the opportunities for an editor just as an educator were so great that a consideration such as peer review really did not need to come up. As one editor summarized the work, he already had in his job description far more than he could manage: "The ruthless rejection of compiled articles written on a typewriter which has lost its quotation marks; the recognition and stimulation of potential genius; the reading of the time aright; the repression of fads; the perpetual combat of charlatanism both without and within the medical profession; the constructive reviewing of books; the collection of news; these and a hundred more components go into the job of being a good medical editor."[23]

Because of their sensitivity to their role as educators, most medical editors who have left public statements emphasized particularly their responsibility to help authors express themselves clearly. "If a journal aims at high literary quality in the material supplied its readers," wrote a leading editor in 1919, "it is obvious, not only that special care must needs be exercised in the selection and acceptance of contributed articles, but also in their editing and preparation for publication."[24]

For years, then, this whole series of editors' priorities, chiefly aimed at developing educational matieral well expressed, simply eliminated a process like peer reviewing.

Models Available

Even if most editors were not motivated to turn to peer review in the late 19th and early 20th centuries, there were nevertheless many examples around to suggest the feasibility of the custom—even beyond practices of the *British Medical Journal* and some other publications in which expertise took a high priority. A few leading organizations used committees or referees to screen articles that would appear in the proceedngs or transactions; the best example was the traditional case of the Royal Society cited by Stephen Lock and by Kronick, and the French groups of the late 18th century that, as Kronick has noted, also censored the contents of publications for the sake of quality. Closely related was the use of committees to award prizes for essays that were then published, as Kronick has noted.[25]

The actual mechanism that most closely resembled modern practice, however, was the custom of book publishers to seek outside advice regarding book manuscripts in technical fields. This custom was widespread by the end of the 19th century. However, the publishers were almost without exception laypersons, not editors who considered themselves experts in the field, and so it was natural for them to seek advice from professional authorities. Thus, New York physician Smith Ely Jelliffe, who was also coeditor of a monograph series, never referred manuscripts for that series out, but, at the same time, he acted as referee for commercial book publishers.[26]

One institution that should have helped introduce peer review into biomedical journals was the editorial board. In fact, it did not necessarily do so, chiefly because in each journal, the board functioned differently. Initially, scientists and physicians whose names appeared as board members or editorial collaborators served to give moral support to the journal and to contribute articles, editorials, clippings, book reviews, and abstracts for the editor to publish. A good board member could, therefore, help round up material for the editor to publish, and recruiting such assistance was particularly useful when the editor was running short. Indeed, initially the boards tended to represent geographic regions rather than special knowledge, and members were supposed, as one hopeful World War I—era editor put it, to "corner" contributions from his or her area for a particular journal.[27]

The titles given to board members were usually not descriptive. In 1915, for example, the *New England Journal of Medicine,* then the *Boston Medical and Surgical Journal,* took on two sets of board members, the "consulting editors" and the "advisory committee." Since such titles had been used so variously with other journals, exactly the extent to which the beginnings of peer review were involved, as the names implied, cannot now be easily ascertained. Some journals did use a committee system to establish an in-house, or limited, peer review system. In the case of the *Schweizerischen Medizinischen Wochenschrift* of Basel, Switzerland, for example, from the 1920s internists and surgeons on the board passed judgment on materials in their respective areas.[28]

Other journals appeared merely to have a committee system in which the element of specialists' judgments was not necessarily present. Before World War I, editorial conferences helped guide the editors of the *New York Medical Journal*, although with how much, if any, specialist input is unknown. In 1910, the founders of the *American Journal of Diseases of Children* proposed to have "an editorial board of four to six pediatrists, who shall have editorial control of the journal in a manner similar to that of the Editorial Board of the *Archives of Internal Medicine";* clearly in this case, some committee system was envisaged, but the extent to which peer review process was thereby put in place was, again, not evident. As late as 1940, another editor criticized such a committee arrangement "to review papers and determine which are worthy of publication." It was, he concluded, "an awkward system, since no such committee can be depended upon for continuous service, and when most needed is likely to be unavailable." In the light of his remarks, it is easy to see, consequently, why an outside referee system presented an attractive alternative.[29]

Growing Competition for Space

Before the pressures of specialization moved editors into adopting some kind of peer review process, another factor entered; namely, as I have suggested, the supply and demand ratio gradually reversed. Where earlier editors had to scamper to fill their pages, the number of at least passable manuscripts, first in one area of medicine and then another, increased greatly so that refusal of good articles became a major problem. The advent of the turndown era thus came, again, piecemeal, but the change was really very radical, at least in the English-speaking countries. Between 1913 and 1925, *The Journal of the American Medical Association* received between 1500 and 2000 manuscripts for consideration.[30]

Fragmentary evidence therefore suggests that the two factors, expertise, on the one hand, and, on the other hand, attempts to sift articles of good quality out from numerous submissions, operated not together, reinforcing each other, but independently, to move journals toward a modern peer review process.[31] In 1901, in a case in which expertise, not overcrowding of pages, was the issue, Harold Moyer, editor of *Medicine* (Detroit, Mich), told of an article that appeared in an eastern journal in which the author claimed to have discovered a substance, ureine, that caused uremia. Ureine, according to the report, constituted 4% of the volume of the urine. Moyer commented: "We are surprised that so startling a statement should not have moved the editor to a careful study of the article in question, and perhaps have led to its being submitted to a chemist before being published in a leading medical journal." Because of the article, Moyer reported, three different investigators took time out to verify the falsity of the claim; the foolish author had confused precipitating chemical products with urine solids. Clearly the model of the outside expert was acceptable to at least this one editor—Moyer—when he recognized that a chemist might have prevented the problem.[32]

By contrast, the *Annals of Surgery* offers an example of alternative pressures that moved editors toward some kind of peer review not so much because of their desire to have expert advice as by their need to discriminate high-quality articles and turn down others in the growing volume of at least plausibly good submissions that they had to consider. The *Annals of Surgery* operated under a single editor, Lewis Stephen Pilcher, until his death in December 1934. At that point, reported his son, James T. Pilcher, in a letter written in 1938, "there was a reorganization of the Editorial Staff and I was appointed the Managing Editor of it with a counseling body of the Editorial Board.... Each article published is reviewed and criticized by at least five members of the Editorial Board before it is accepted for publication which we feel insures and assures its degree of excellence, accuracy, and authoritativeness."[33] Pilcher's easy assumption that marginal articles could be turned down contrasts with the despera- of earlier editors to find material to fill their pages.

The Irregular Growth of Peer Review

Available case histories of the coming of peer review to biomedical journals in fact do not usually reveal the full motives of the editors. What they do show is that peer review came at various times to various journals for a wide variety of reasons—and the timing could be accidental, as when an editor died or retired, as well as for other reasons peculiar to any given journal. Moreover, when peer review did come, it was institutionalized in a variety of ways.

As for just when the process was established generally, the most accurate statement the available evidence can afford is that peer review became the standard in biomedical journals in the English-speaking countries and in at least some places in continental Europe, such as the Netherlands and Switzerland, not long after World War II, or approximately the mid-20th century.

Editors of strictly scientific journals apparently were not necessarily any quicker to adopt the practice than were those of medical journals. J. McKeen Cattell, the editor of *Science*, for example, as late as 1938 relied on personal solicitations for most of his articles, and in one rare case in which he referred out a physiological article, by Leonard Carmichael, he sent it to his son, McKeen Cattell, whom he characterized as "our referee in physiology" when he wrote to turn the article down. Some of the experimental medicine journals, however, may have influenced each other by means of shared editorial and consultant personnel to move to expert referral in the first decades of the 20th century.[34]

The variations in time when journals converted to modern peer review were almost extreme. In addition to the processes of the *British Medical Journal* in the 19th century, it is known that by very early in the 20th century the *Lancet* had developed a wide network of peer reviewers. "Each is an acknowledged expert in his own particular line. Apart from reviews, to him are referred all matters of questions that crop up in different departments in regard to his own special field," reported one witness. By contrast, as late as the 1930s and 1940s, *The Journal of the American Medical Association* depended on a very small internal staff for virtually all editorial decisions. Only on most unusual occasions was an outside, "more expert opinion...sought," reported Editor Fishbein, and "this took place," he said, "rarely indeed." We know that in the 1930s, for both the *Journal of Hygiene* and *Parasitology,* the editor made his decisions "either with or without the assistance of a referee"—but it is certainly notable that the institution of referee was sufficiently established to be alluded to as such without any explanation. By 1946, Michael Polanyi, in his classic *Science, Faith and Society,* placed the scientific journal referee into the context of a whole system by which scientists established consensus and authority.[35] Yet even at that date, 1946, as I have indicated, many biomedical publications still were not using peer review.

The history of one, the *Journal of Clinical Investigation*, is particularly revealing, for it shows that in that case peer reviewing really did start evolving through the editorial committee but did not begin to approach the present form until the 1940s. Even before the journal actually began publishing in 1924, the founders developed a scheme to operate with a committee of experts, the editorial board, and the editor in chief was to act simply as coordinator. Each manuscript went to the board member best qualified by scientific credentials to judge it. By 1942, the expertise of the members of the board could no longer encompass what a report of the society called "the lines of approach to disease and especially the technics employed," which had become "so many and various." Therefore, the journal then switched to what the officers called the "wide open" refereeing process, using not only members of the sponsoring society but any outsiders needed in addition. Moreover, in the wide-open system, two opinions, rather than one, guided the editor and, as the system worked out, also helped the author, whether or not the article was accepted for publication, since he or she would receive the referees' reports.[36]

The experience of one American medical editor, R. H. Kampmeier, illustrates in a peculiarly vivid way the variable rate of the mid-20th century transition to a peer review standard. From 1954 to 1962, Kampmeier, by chance, was editing three entirely different types of medical journals simultaneously. One *(American Practitioner,* from 1946 as an associate and then, after 1958, as sole editor) was conducted in the old, traditional manner with editorial board members appointed for the purpose of acquiring articles and occasionally helping with expert comments on articles that they had solicited. The second journal *(Tennessee Medical Association Journal,* which Kampmeier edited from 1950 to 1971) was a state journal edited entirely by the editor, who did not even send galleys to the authors. However, for the third journal, the *Southern Medical Journal* (editor, 1954 to 1972), Kampmeier used an extensive editorial board for modern peer reviewng and also had the expert opinions of the Southern Medical Association section chairpersons and secretaries.[37]

Comment

In the light of these fragments of evidence, I have concluded that the development of editorial peer reviewing does not fall into clear patterns. The procedures came into the different journals in science and medicine over a very long period and were not standard until some point in the mid-20th century that cannot now be determined. For example, as far as I known, no one has done a study of when the distinction between refereed and nonrefereed articles came to be important in various kinds of situations and institutions, most notably in academic promotion and in funding. Casual referring out of articles on an individual basis may have occurred at any time beginning in the early to mid-19th century, but *institutionalization* of the process in various editorial settings took place mostly in the 20th century—either to handle new problems in the numbers of articles submitted or to meet the demands of an increasingly specialized world.

There was no discernible movement to establish editorial peer review, as one finds movements in other social phenomena, and sociologists as well as historians may wonder why, for once (and at least up to the mid-20th century), human beings did not rush to imitate each other. Rather, in each case, physicians and scientists who were editors or publishers attempted independently to adapt to changes in their disciplinary and professional environments. If they knew the models of peer reviewing that Kronick has found in the 18th century or that existed in succeeding generations, the editors denied that those examples applied to their own particular journals, and they, therefore, did not attempt to borrow procedures from colleagues.

Indeed, as late as 1946, the *American Journal of Medicine* was founded with practically no use of peer reviewing but rather as a reversion to personal editing, and it was remarkably successful. Moreover, as late as the 1970s, the *Lancet*, one of the pioneers of peer reviewing, reverted temporarily to mostly inhouse refereeing.[38] Nevertheless, the drift of events still remains clear: over a long period of time, peer reviewing appeared more and more frequently, in a progressive fashion, even if not as a movement, but more or less spontaneously as each editor or sponsoring group decided that the time had come to shift to a new type of procedure and wittingly or unwittingly followed a model that had been available for a long time.

This pattern—or lack of pattern—is more astonishing because it contrasts with what happened in the history of peer reviewing of grant applications. Grant peer reviewing developed as communities of scientists became aware of such a possibility and such a procedure by participating in the process. In the United States, the system began to precipitate early in the 20th century in the work of the Carnegie Institution of Washington, DC. Although it was implicitly confused for some time with "old boy" networks, the formal procedure was so well understood that it was actually established by law in 1937 for grants from the National Cancer Institute. Despite setbacks during World War II, grant peer reviewing continued to expand, even into the private sector.[39]

This quite different history of grant peer reviewing underlines the peculiarities in the evolution of editorial peer reviewing. As I stated previously, the very fact that editorial peer reviewing appeared quite independently of grant peer reviewing is disconcerting.[40] Moreover, the way in which editorial peer reviewing appeared sporadically, and did not spread, contrasted with the way in which scientists established grant peer review through personal contact and example within the scientific community. Grant peer reviewing spread by diffusion. Editorial peer reviewing, despite occasional borrowing, especially in more modern times, tended to develop by independent evolutionary processes at each journal. Finally, the editorial board did not necessarily constitute an intermediate step in developing peer review process.

The history of editorial peer review, therefore, underlines the fact that it is a unique institution with unique problems. Even late in the 20th century, practice still varied greatly from one journal to another—was one referee used, or two, for example, and under what conditions? As papers presented at The First International Congress on Peer Review in Biomedical Publication reveal, to "use" peer review still covers a broad spectrum of types of employing outside and expert opinion.

The problems in which the present reflects events of the past go beyond the circumstance that research articles proliferated in the 20th century and that specialization affected all biomedical activities. One problem is the educational function of both editing and peer reviewing; another is the attempt to introduce objectivity, as opposed to personal journalism; still another is the consciousness of the authority of science and the gatekeeping that undergirds it; and still another is efficiency—can items like "ureine" be kept out of the literature so that replication of results will not be necessary? Such considerations go on and on.

The very untidiness of the historical record of the development of editorial peer reviewing suggests the complexities that are involved in the functioning of the institution as it has matured in the late 20th century.

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10. See especially la conference international de la press médicale. *Gazette médicale de Paris.* 1902;9:68. 11th series; Conference internationale de la presse médicale—Convention de Monaco. *Gazette médicale de Paris,* 1902;2:130-1. 11th series; International Association of the Medical Press. *Lancet* 1913;2:436-7. Zuckerman H, Merton R: Patterns of evaluation, footnote, p 75, note research showing that in contrast to American journals, among French journals in the early 1960s a very substantial proportion still did not use peer review. Fox T: *Crisis in Communication: The Functions and Future of Medical Journals.* London, England: Athlone Press; 1965, still considered the newspaper model as an important one to distinguish different approaches to medical editing.

11. See especially, Peterson MJ: Specialist journals and professional rivalries in Victorian medicine. *Victorian Periodicals Newsletter* 1979;12:25-32. There were, of course, allegations that journals often served to advertise the editor's practice; see, for example, Davis NS: Address on the history, condition, and means of improvement of medical journalism in the United States.*Chicago Med Examiner* 1870;11:416-7.

12. Martin FH: Surgery, gynecology and obstetrics.*Surgery, Gynecology and Obstetrics.* 1905;1:62. There were also a large number of "collaborators," approximately half of whom explicitly "represented" various US cities in the more traditional way that editorial boards had offered moral support.

13. See Reingold N, ed. *Science in Nineteenth-Century America: A Documentary History.* New York, NY: Hill & Wang Inc; 1964; 262-6.

14. Burnham JC: In: McGuire W, ed. *Jelliffe: American Psychoanalyst and Physicians; & His Correspondence With Sigmund Freud and C. G. Jung.* Chicago, Ill: University of Chicago Press; 1983; 1983: especially chap 3.

15. Marks HM: Local knowledge: experimental communities and experimental practices, 1918-50. Presented at the Conference on Twentieth Century Health Sciences; May 23, 1988; San Francisco, Calif.

16. Hart E: Medical journalism. *Med News* 1893;62:655.

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18. A comprehensive description of the motives of various types of medical editors found in Connor L: The American medical journal of the future as indicated by the history of American medical journals in the past. *JAMA* 1884;2:650-7. Some of the problems editors faced many years ago may not be obvious today, but they helped distract those editors from the possibility of referring articles out; for example, one trap for unwary editors was an article that was a disguised plug for a proprietary remedy; see Chassaignac C: Medical journalism. *New Orleans Med Surg J* 1900;52:718-9.

19. Billings JS: Literature and institutions. *Am J Med Sci* 1876;72:460. C. Stanford Read to Smith Ely Jelliffe, February 3, 1921, Smith Ely Jelliffe Papers, Library of Congress, Washington, DC, Box 16.

20. On resistance to specialization, see especially Konold DE: *A History of American Medical Ethics, 1847-1912.* Madison: University of Wisconsin Press; 1962. Mathews JM, reported in *Proceedings of the American Medical Editors' Association.* 1910:94. Mathews was the American father of the specialty of proctology.

21. Even *The Journal of the American Medical Association,* wrote one aggrieved editor in 1913, "is a publication which belongs to the Association, with no member or group of members entitled to special rights or privileges in its pages. In other words, each member has rights in the *Journal* identical with thos of every other member." The status of the American Medical Association under the law. *J Am Med Editors' Assoc* 1913;1:52. The problem per vaded medical journalism; for one case history, see Burnham JC: The founding of the *Archives of Neurology and Psychiatry;* or, what was wrong with the *Journal of Nervous and Mental Disease? J Hist Med Allied Sci* 1981;36:317-8. State and local medical journals had special problems of unselective contents; see, for example, Hammond FC: The relation of the state medical journal to the state medical society. *Am Med Assoc Bull* 1931;26:49-58; Musser JH: Why a state medical journal? *Am Med Assoc Bull* 1930;25:35-40.

22. See, for example, Ashby TA: Medical journalism in Maryland. *Trans Med Chirurgical Faculty State Md* 1881;83:316.

23. On the writing of medical editorials: *Nations's Health* 1922;4:86. See especially, the *Proceedings of the Ameridan Medical Editors' Association* and its successors, including Medical Mentor.

24. The problem of editing contributed articles.*J Am Med Editors' Assoc* 1919;4:22.

25. See also, Fischer I: Medizinische Preisfragen. *Janus* 1938;42:24-43.

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27. Examples include Bunker WH: The *Maine Medical Journal. Maine Med J* 1934;25:32; Burnham JC; The founding. 322.

28. Garland J: The *Boston Medical and Surgical Journal,* 1828-1928. *N Engl J Med* 1928;198:10. Garland J: The *New England Journal of Medicine,* 1812-1968. *J Hist Med* 1969;24:132, claimed that the editorial board "met each month to discuss the papers submitted, following the pattern established in 1812." Hintzsche E: *Medizin und Mediziner seit 1870 im Spiegel der Schweizerischen Medizinischen Wochenschrift.* Basel, Switzerland: Schwabe & Co; 1971:384.

29. A.R. Elliott to Smith Ely Jelliffe, January 31, 1917, Jelliffe Papers, Box 6. The *American Journal of Physiology* developed a committee system that involved some embryonic peer review but mostly helped obtain articles; Appel TA: First quarter century. In: Brobeck JR, Reynolds OE, Appel TA, eds. *History of the American Physiological Society: The First Century, 1887-1987.* Bethesda, Md:

The American Physiological Society: 1987:70-2. In the World War I era, it took one council member to accept an article but two to reject it. Grulee CG: The *American Journal of Diseases in Children. AJDC* 1951;81:374. Smith CA: Development and problems of a state medical journal. *Bull Med Libr Assoc* 1940;29:81. In 1975, Houghton B: *Scientific Periodicals: Their Historical Development, Characteristics and Control.* London, England: Linnet Books & Clive Bingley; 1975;43, still considered the board the primary peer reviewers. Still another function of the board could be to advise the editor on which outside referees to use; see, for example, Raun GC: The role of the editor. In: Melvin JH, ed. *A Workbook for Journal Editors.* Columbus, Ohio: Association of Academies of Science; 1970:10.

30. Garland J: Medicine as a social instrument: journalism. *N Engl J Med* 1951;244:843. Simmons GH, Fishbein M: The art and practice of medical writing. *JAMA* 1925;84:892.

31. Another possibility, which for lack of much evidence I have not introduced except as it was part of the changing intellectual milieu, was the developing ideology of science. As objectivity became increasingly a conscious goal of editors, personal journalism went out of style in newspapers as well as medical publications; see, for example, Schudson M: *Discovering the News: A Social History of American Newspapers.* New York, NY: Basic Books Inc Publishers; 1978. Whalen CJ: The job of editing a medical journal. *IMJ* 1931;59:287-8, for example, wrote that "Personal prejudices and preferences of an editor are eliminated from the policy of a medical journal with the [same] impartiality and impersonality as that with which an honest judge passes on the merits or demerits of a case. When it comes to his work, an editor can have no self."

32. Moyer HN: The relation of the medical editor to original communications. *Ann Gynecol Pediatry* 1901;14:694-5.

33. James T. Pilcher to Smith Ely Jelliffe, March 21, 1938, Jelliffe Papers, Box 16.

34. Leonard Carmichael to J. McKeen Cattell, July 25, 1938, and annotated; J. McKeen Cattell to Leonard Carmichael, August 19, 1938, Cattell Papers, copies generously furnished by Professor Michael Sokal, who kindly also furnished information regarding *Science.* Further information regarding *Science* and the evolution of its refereeing procedures, beginning with the editorial board in mid-century, is in Sokal MM: *Science* and James McKeen Cattell, 1894 to 1945. *Science* 1980;209:43-52; and especially Walsh J: *Science* in transition, 1946 to 1962. *Science* 1980;209:56; and Wolfle D: *Science:* a memoir of the 1960's and 1970's. *Science* 1980;209:57-8. Harry M. Marks who has worked in a number of institutional and personal papers, in a personal communication suggest that in the United States, scientific journals in the biomedical field that were (1) scientific society journals, such as the *Journal of Experimental Pharmacology,* or were (2) connected with the Rockefeller Institute, such as the *Journal of Cellular and Comparative Physiology,* by the 1920s or before had established de facto peer review and that this grouping had therefore effectively instituted a pattern and standard of editorial peer review of which workers in experimental medicine were well aware.

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37. Kampmeier RH: Personal communication, July 18, 1989.

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40. Medical personnel, as Chester Burns, MD (oral communication, April 29, 1989), has suggested to me, would have been acquainted with another important type of qualitative discrimination, namely, the selection of students for admission to medical school, carried out in the early days by the dean (analogous to the editor) and later by one or more admission committees.

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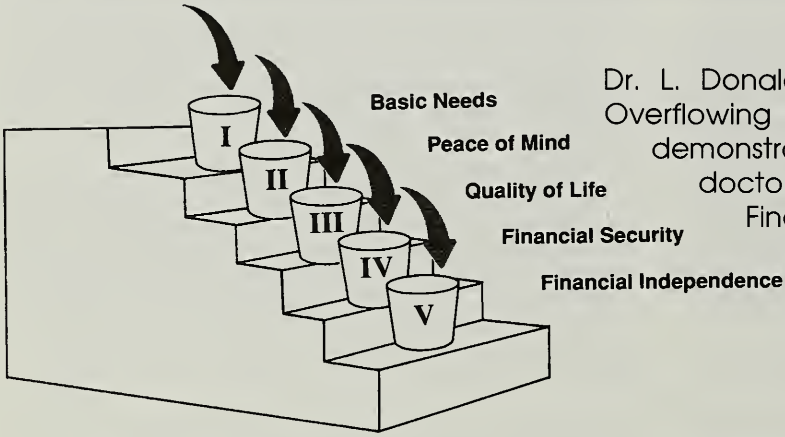

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Persistent Vegetative State and the Decision to Withdraw or Withhold Life Support

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Persons with overwhelming damage to the cerebral hemispheres commonly pass into a chronic state of unconsciousness (ie, loss of self-awareness) called the *vegetative state.* When such cognitive loss lasts for more than a few weeks, the condition has been termed a *persistent vegetative state*, because the body retains the functions necessary to sustain vegetative functions. Recovery from the vegetative state does occur, but many persons in persistent vegetative states live for months or years if provided with nutritional and other supportive measures. The withdrawal of life support from these persons with loss of higher brain function is a controversial issue, as highlighted by public debates and judicial decisions. This article provides criteria for the diagnosis of permanent unconsciousness and reviews the available data that support the reliability of these criteria. Significant legal decisions have been made with regard to withdrawal of life support to patients in persistent vegetative states, and the trends in this area are discussed.

RECENT public debates and judicial decisions have highlighted the issue of when it is justifiable to end life support for persons with loss of higher brain functions. In cases involving persons classified as permanently unconscious, several courts have authorized caretakers to withdraw or withhold treatments that served only to sustain vegetative functions and offered no prospect of restoring cognition or sapience.[1,11] Judges have articulated various rationales, but common themes are that patients have a legally enforceable right to decline life-prolonging treatments and that their caretakers have no legal duty to prolong life when treatment will not restore consciousness or produce other medically definable benefits. The suggestion that ending treatment in this circumstance is a form of criminal homicide has been firmly rejected.[1,4,8,9] Dissenting judges and some others, however, have raised questions about the correctness of particular decisions, have challenged the logic of denying a causal relationship between ending treatment and inducing death, and have expressed concern that the category of persons whose deaths may be hastened will be expanded beyond morally tolerable limits once society begins to allow permanently unconscious persons to die.[2,9,12-16]

Interesting though the legal opinion may be, in the final medical analysis it becomes the physician's responsibility to determine when, with overwhelming probability, a patient's higher brain function, including his or her self-awareness, is permanently lost. Given the family's emotional suffering and the heavy social and economic costs of maintaining a residual collection of systemic body organs, the physician should be ready to assist the patient's family or guardian in deciding what is in the patient's best interest.

This review addresses concerns regarding the reliability of determinations of permanent unconsciousness, indicates criteria that permit a reasonably certain diagnosis of permanent unconsciousness, and considers the matter of distinguishing severely impaired persons who will not improve from those who may. The ethical aspects of the decision to withdraw or withhold life support from patients in a permanently unconscious state have been extensively analyzed and will not be further developed in this report.[17-19] Since the significant legal decisions have occurred in this area, the trends relating to the role of physicians in deliberations about whether to refrain from providing life support are reviewed.

Diagnosis of Permanent Unconsciousness

Definition

Consciousness has two dimensions: arousal and the cognitive content of the aroused state. Arousal is a vegetative function maintained by deep brainstem-medical diencephalic structures in the brain, in contrast to learning, memory, self-awareness, and adaptive behavior, all of which depend on the functional integrity of the cere-

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From the Council on Scientific Affairs and the Council on Ethical and Judicial Affairs, American Medical Association, Chicago, Ill.

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This report is not intended to be construed or to serve as a standard of medical care. Standards of medical care are determined on the basis of all of the facts and circumstances involved in an individual case and are subject to change as scientific knowledge and technology advance and patterns of practice evolve. This report reflects the views of scientific literature as of June 1989.

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bral cortical mantle and its associated subcortical nuclei.

Pathological loss of consciousness may follow a variety of insults to the brain, including, among others, nutritional insufficiency, poisoning, stroke, infections, direct physical injury, or degenerative disease. Complete loss of consciousness may develop abruptly or slowly. Abrupt loss of consciousness usually consists of an acute sleeplike state of unarousability called *coma* that may be followed either by varying degrees of cognitive and physical recovery or by severe, chronic neurological impairment. The stage of coma itself, however, is invariably temporary and in progressive disease is often absent altogether. In either event, persons with overwhelming damage to the cerebral hemispheres commonly pass into a chronic state of unconsciousness (ie, loss of self-awareness) called the *vegetative state.* In the vegetative state, the body cyclically awakens and sleeps, but expresses no behavioral or cerebral metabolic evidence of possessing cognitive function or of being able to respond in a learned manner to external events or stimuli. This condition of total cognitive loss can follow acute injuries that cause coma or can develop more slowly as an end result of progressive structural disorders, such as Alzheimer's disease, that in their end stages also can destroy the psychological functions of the cerebrum. When such cognitive loss lasts for more than a few weeks, the condition has been termed a *persistent vegetative state* (PVS), because the body retains the functions necessary to sustain vegetative survival.[20,21] Some have applied the term *cognitive death* as a synonym for the state. Recovery from the vegetative state is possible, especially during the first few days or weeks after onset, but the tragedy is that many persons in PVS live for many months or years if provided with nutritional and other supportive measures.[22] Present requirements of health reporting fail to provide an accurate estimate of the incidence and prevalence of PVS in the United States. Ten years ago, a prevalence of 2 to 3 per 100,000 was estimated for Japan.[22,23] It seems likely that the absolute number of such cases has risen appreciably as a consequence of current practices in critical medicine, cardiorespiratory support, parenteral feeding, and control of infections in severely brain-damaged patients. If one includes patients totally demented from Alzheimer's disease and similar disorders, an estimate of the number of persistently vegetative patients in this country is approximately 15,000 to 25,000. How to deal with this emotionally painful, financially costly, and generally unwanted outcome of modern medical treatment is an increasing problem.

Clinical Criteria of PVS

The distinguishing feature of PVS is chronic wakefulness without awareness. Such unconscious wakefulness can be accompanied by spontaneous eye opening, the utterance of unintelligible, instinctive grunts or screams, or even the display of brief smiles, as well as sporadic movements of facial muscles and nonparalyzed limbs. Despite an "alert demeanor," observation and examination repeatedly fail to demonstrate coherent speech, evidence of comprehension of the words of examiners or attendants, or any capacity to initiate or make consistently purposeful movements. What movements do occur are largely confined to reflex withdrawals or posturing in response to noxious or other external stimuli. Since neither visual nor auditory signals require cortical integrity to stimulate brief orienting reflexes,[24] some vegetative patients may turn the head or dart the eyes toward a noise or moving objects. However, PVS patients neither fixate on nor consistently follow moving objects with the eyes, nor do they show other than startle responses to loud stimuli. They blink when air movements stimulate the cornea, but not in the presence of visual threats per se. By themselves, no confirmatory tests provide an accurate diagnosis or prognosis, but position emission tomography in PVS patients has shown severely depressed energy metabolism uniformly distributed throughout the cortical and immediate subcortical areas of the cerebral hemispheres; this is equivalent to what is found during deep general anesthesia in normal persons.[21]

Brain imaging studies in PVS may or may not reveal multifocal or diffuse lesions and cortical atrophy, depending on the cause and duration of the condition. Most persons in PVS show tonic reflex oculovestibular movements freed by the injury from normal cortical restraint. As noted, some will meaninglessly smile, many chronically chew or clamp the teeth, and most have impaired motor functions with varying degress of weakness, spasticity, posturings, and contractures of the limbs. If provided with supported nursing care in the chronic state, nearly all PVS patients maintain near-normal body temperatures. All are incontinent of urine and stool. Cardiorespiratory activity, swallowing, and digestive and other nonneurological vital functions are usually preserved to the extent that standard nutritional and supportive measures will sustain life indefinitely. Persons in PVS ordinarily require neither long-term respiratory support nor circulatory assistance to survive.

Once qualified clinicians have determined that a person is awake but unaware, the prognosis to the performance of the vegetative state depends on the age of the patient, the nature of the brain injury, and how long the period of awareness has already lasted. Irrespective of cause, vegetative patients younger than 40 years have a better chance of recovering self-aware consciousness after a delay of several months than do other ones. Similarly, those who become vegetative following brain trauma or subarachnoid hemorrhage are more likely to show a long delayed return of consciousness than are patients who have suffered several asphyxial injury, such as follows cardiac arrest.[25,26]

To be more specific about guidelines, with the exception of children, in whom too little evidence exists to offer reliable conclusions, few if any patients who remain vegetative following cardiac arrest or similar asphyxial injuries recover after 1 month and essentially none will regain cognition after 3 vegetative months. Patients with less severe, purely anoxic injuries, eg, from carbon monoxide poisoning, do somewhat better, but even in such cases recovery of consciousness after 3 months is limited to rare patients considerably younger than 40 years. The prognosis for cognitive return in patients younger than 40 years with head injury or subarachnoid hemorrhage is somewhat better than the above, but still relatively poor. Accurate percentages are lacking, but nevertheless, sufficient numbers of patients in these categories begin to show at least a measure of cognition between 3 and 6 months that decisions about continuing care should be deferred beyond that time.[25,26] A few reports describe a return of cognition even beyond the 6-month time in persons younger than 25 years.[27,28] Some of these may have represented patients who entered an unrecognized "locked-in" state shortly after reawakening from a coma-causing injury.[29] Ultimately, all have been severely disabled.

These rare examples notwithstanding, data indicate with high probability the lengths of time, according to age and the nature of disease, when patients can safely be regarded as having reached a permanent, hopeless vegetative state.[30,31] Even in young persons who have experienced head trauma, a conservative criterion for the diagnosis of PVS would be observed unawareness for at least 12 months. Cognitive recovery after 6 months is vanishingly rare in patients older than 50 years. If the handful of reported occurrences of cognitive recovery in patients with PVS[28] are divided by the total estimated number of PVS cases in this country, the odds of recovery are less than 1 in 1000. The risk of prognostic error from widespread use of the above criterion is so small that a decision that incorporates it as a prognostic conclusion seems fully justifiable.

Differential Diagnosis

Inherent in the process of diagnosing PVS is to distinguish it from other severe neurological impairments that may produce less severe but still permanent cognitive impairment. The greatest difficulty lies in deciding if the various sounds and movements occasionally encountered in a totally demented, speechless person reflect cognitive responses to internal or external stimuli or merely have an instinctive origin emanating from deep undamaged cortical structures.

A less difficult problem, but one that has arisen in some legal disputes over decisions to remove life support,[2,7] consists of distinguishing PVS from the locked-in syndrome or de-efferented state. The locked-in state can result from interruption of descending motor pathways any place along their course from the ventral pons to the peripheral nerves.[32,33] In this condition, paralysis, not cognitive failure, leads to a lack of ability to communicate. Both vocal control and all appropriate bodily responses to stimuli can be lost. Nevertheless, awareness may be partially or fully preserved; in those with ventral pontine or bulbar intramedullary lesions, communication often can be established using an eye-blink or other signaling strategy.[32] What few positron emission tomography studies in such patients exist indicate that cerebral energy metabolism is only moderately reduced below normal, in contrast to the profound disturbances observed in PVS.[21] Electroencephalograms do not distinguish between vegetative and locked-in patients, since vegetative persons can have near-normal electroencephalograms, and abnormal electroencephalogram-blocking responses have been found in persons awake and self-aware but totally paralyzed from peripheral neuropathy (Fred Plum, MD, written communication, 1989). In these circumstances, serial examinations by neurologically trained physicians usually will resolve any residual confusion. If uncertainty remains after careful clinical appraisal, however, positron emission tomography studies may be helpful if available. In any event, if characteristic signs and symptoms of PVS are lacking and any doubt exists, the diagnosis should be avoided or deferred because of its connotations for decisions about levels of future care.

Pain and PVS

One aspect of the debate about stopping treatment in PVS focuses on a concern that the afflicted person will experience suffering after treatment is stopped (eg, will experience dyspnea after removal of a respirator or face discomfort associated with starvation and dehydration after removal of a feeding tube). The most obvious contradiction to this projection is that, by definition, in PVS both the person's capacity to perceive a wide range of stimuli and the neocortical or higher brain functions that are needed to generate a self-perceived affective response to any such stimuli are destroyed. Pain cannot be experienced by brains that no longer retain the neural apparatus for suffering.

Legal Implications of Decisions to Withhold or Withdraw Life-Prolonging Medical Treatment

Over the past decade, there has been a broad societal consideration of the ethics of withdrawing or withholding life support from patients who are permanently unconscious.[17-19]

Courts in several states have addressed a variety of cases in which caretakers sought authority to withhold or withdraw ventilators or nutritional support from patients who are permanently unconscious. While most of these rulings have approved requests to end life support, there have been notable exceptions.

Despite the different legal rulings in the various states that have decided whether treatment can be withheld or withdrawn, some general principles emerge. First, mentally competent patients have a general right to refuse medical treatments, even at the risk of death.[34] In addition, if a person has indicated whether life-sustaining treatment should be administered or withheld in the event of permanent unconsciousness, the courts will respect the person's previously expressed desires.[35] This is known as the "subjective test." To ensure that the patient truly would have wanted life-sustaining treatment to be withheld or withdrawn, many states require a showing that the patient's desires were "clearly and convincingly" expressed.[36] In one case, for example, where the patient had participated in formal discussion about the Karen Quinlan case at a Catholic high school and stated that he would not want to be maintained on a ventilator in a persistent vegetative state, the court sanctioned removal of the ventilator.[37]

In practice, the subjective test has limitations. This is because courts often discount a person's prior statements when they were made in general terms, in casual circumstances, as a spontaneous reaction to another person's medical treatment, or while the person was young and in excellent health.[38] Hence, in the absence of formal documentation or of repeated expressions in the setting of formal discussions, courts may find that the patient's wishes were not clearly expressed. The court's finding will sometimes turn on the nature of the life-sustaining measure. For example, some courts are more likely to permit withdrawal of a ventilator than withdrawal of artificial feeding.[39] This difference primarily reflects the fact that ventilators are more readily viewed as "heroic" or "extraordinary" than are artificial feedings. However, most courts and ethicists reject this distinction and treat artificial feedings in the same way as ventilators.[40]

Some state legislatures have recently created devices (eg, living wills or designation of an agent to make health care decisions in the event of mental incompetence) that facilitate the documentation of an individual's desires in the event of permanent unconsciousness.[41]

If patients have not expressed their wishes clearly and convincingly, it is important to determine what standards of decision making apply. In general, family members, or other guardians, are permitted to make treatment decisions on behalf of the patient on the basis of what they believe the patient would have chosen if competent to decide. This is known as "substituted judgment."[42] A few recent developments, however, raise questions about how broadly this general rule applies. In Missouri, the state supreme court has refused to honor the request of the parents to discontinue gastrostomy feedings for their daughter, who was in PVS as the result of an automobile accident.[43] Moreover, the court left open the question whether artificial feedings can ever be discontinued. Oklahoma passed a statute that prohibits the withdrawal of food and water in the absence of very specific directions by the patient that withdrawal would be the desired course.[44] And, in a case involving nasogastric tube feedings and a patient who was not permanently unconscious but was severely demented, New York's highest court suggested that artificial life support can never be withdrawn in the absence of clear expressions by the patient.[45]

As this discussion indicates, surrogate decision making by family members or other representatives is more likely to be disregarded when they seek the withdrawal of food and water rather than ventilators, or when the patient has severe impairments but is not permanently unconscious. In any event, it is unlikely that a court would overrule a decision to withdraw a ventilator from a permanently unconscious patient.

When a situation arises in which it is permissible to withdraw treatment, the medical profession has been given a very specific, technical role. The attending physician must make the diagnosis of permanent unconsciousness and, in some states, at least two other physicians with no interest in the case must confirm the diagnosis. These other physicians have been characterized as the "prognosis board."[46] Whether or not required by law, consultation with other physicians in determining prognosis is both desirable and appropriate. The consulting physician should be a neurological specialist or someone skilled and experienced in making neurological diagnoses.

Once a diagnosis of permanent unconsciousness has been made, decisions to withhold or withdraw life-prolonging medical treatment ordinarily can be implemented without resorting to the courts. Although judicial intervention has been sought for a variety of reasons by a variety of parties, it is appropriate only when there is a dispute among family members or other guardians about the patient's wishes or interests or among physicians regarding the diagnosis.[47] Consultations with ethics committees can play an important role in helping the family to come to a decision.

Situations may arise in which a request is made to discontinue treatment, but the attending physician is personally opposed to participating in the withdrawal. In those cases, the physician should transfer the patient to a physician who is willing to carry out the decision.[48] There is a New Jersey Supreme Court case, however, that suggests that the treatment must be withdrawn over the objection of the physician if the transfer cannot be carried out without inordinate delay, so as not to frustrate the patient's right to refuse treatment.[49]

As indicated, the law in this area turns very heavily on court cases and legislation in the different states. In recently accepting a case involving withdrawal of life support from a patient in PVS, the US Supreme Court will, by the summer of 1990, establish a more uniform legal standard for such medical action.

Summary

The poignant situation of human beings who are alive but unaware has evoked wide-ranging debate, major court decisions, and new legislation. Even as intimate participants in decisions about how vigorously to treat comatose or vegetative patients who are unlikely to improve, physicians may question their appropriate role. On the one hand, they recognize that their capacity to achieve a diagnosis and highly probable prognosis represents the indispensable basis for any decision. In this respect, clear clinical criteria have been enunciated and are strongly supported by scientific data, with prognostic probabilities available from several sources. But they also are at risk of having their personal attitudes enmeshed in the ethical and legal ramifications of decisions about levels of care and of becoming advocates of a particular choice based on their own principles and interpretations of the facts. If this occurs, it is well to recognize that a central legal concern is to try to discern what the patient would have chosen, not what physicians or other caretakers believe is desirable. In this respect, decisions necessarily will be influenced by the laws of the particular jurisdiction. To date, the states have not enacted uniform laws or judgments. Nevertheless, the record to date indicates that when physicians and families agree on a particular course, the prospect of adverse legal consequences is greatly diminshed.

Appendix

Current Opinions of the Council on Ethical and Judicial Affairs of the American Medical Association—1989

Withholding or Withdrawing Life-Prolonging Medical Treatment (2.20).—The social commitment of the physician is to sustain life and relieve suffering. Where the performance of one duty conflicts with the other, the preferences of the patients should prevail. If the patient is incompetent to act in his own behalf and did not previously indicate his preferences, the family or other surrogate decision-maker, in concert with the physician, must act in the best interest of the patient.

For humane reasons, with informed consent, a physician may do what is medically necessary to alleviate severe pain, or cease or omit treatment to permit a terminally ill patient to die when death is imminent. However, the physician should not intentionally cause death. In deciding whether the administration of potentially life-prolonging medical treatment is in the best interest of the patient who is incompetent to act in his own behalf, the surrogate decision-maker and physician should consider several factors, including: the possibility for extending life under humane and comfortable conditions; the patient's values about life and the way it should be lived; and the patient's attitudes toward sickness, suffering, medical procedures, and death.

Even if death is not imminent but a patient is beyond doubt permanently unconscious, and there are adequate safeguards to confirm the accuracy of the diagnosis, it is not unethical to discontinue all means of life-prolonging medical treatment.

Life-prolonging medical treatment includes medication and artificially or technologically supplied respiration, nutrition or hydration. In treating a terminally ill permanently unconscious patient, the dignity of the patient should be maintained at all times.

Withholding or Withdrawing Life-Prolonging Medical Treatment—Patients' Preferences (2.21).—A competent, adult patient may, in advance, formulate and provide a valid consent to the withholding or withdrawal of life-support systems in the event that injury or illness renders that individual incompetent to make such a decision. The preference of the individual should prevail when determining whether extraordinary life-prolonging measures should be undertaken in the event of terminal illness. Unless it is clearly established that the patient is terminally ill or permanently unconscious, a physician should not be deterred from appropriately aggressive treatment of a patient.

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Vertical Foot Board

E. TREMAIN BRADLEY, M.D.

Treating her poliomyolitis patients, Sister Kenny elevated the head of the bed slightly, keeping the patient down with the feet against a vertical board. Thus, whatever nerve impulses came through could stimulate the calf muscle fibres and minimize atrophy, at the same time preventing contracture.

A 73-year-old lady fell and suffered a comminuted fracture of the left patella. The bone was removed and the quadriceps tendon sutured to the patellar tendon. She was kept in bed for 28 days. The first time out of bed she walked the entire length of the corridor and back. Instead of weakness and muscle atrophy she had maintained mobility and strength in her legs. Why? A vertical footboard had been at the bottom of her bed to exercise on, without strain on the intertendonous suture line.

Following a wave of pulmonary embolisms from phlebothromboses in deep leg veins, legs were wrapped to prevent venous stasis. But walking provides the pumping action to push the venous blood toward the heart, so why not "walk in bed?" For a duration of several days or more, a vertical foot board (described below) approaches "walking" and keeps the venous blood flowing cephalad — along with maintaining muscle tone. Preoperative patients can be taught to dorsiflex the feet, stretching the calfs, and then alternately plantarflexing. In the operating room when the surgical drapes are removed, the feet are firmly dorsiflexed manually by the surgeon and then allowed to go loose, this procedure being repeated six or seven times. Then in the recovery room the nurses are trained to perform the same maneuver periodically. The combined use of this method and the vertical foot board resulted in only one significant pulmonary embolism in 37 years of a general surgeon's practice.

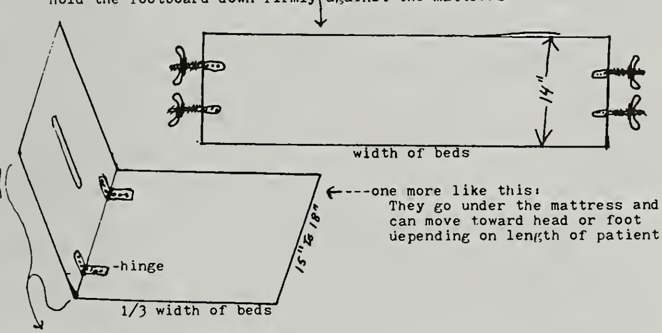
Very uncomfortable for the patient is the pressure of bed clothes on the ends of the toes, which even causes necrosis at times in older or debilitated people. The vertical foot board (specifications on diagrams) keeps the bedclothes up and allows free foot and leg motion. The board should be padded (or wrapped) with a bath blanket or towel — which can be changed — for the patient's comfort.

The adjustable foot board can accommodate to patients of any size, but any vertical board is better than none. Even a wooden crate or a *sturdy* liquor carton braced so as not to fall off the end of the bed, and to stay reasonably vertical, can be useful. The diagram shown here are samples which can be altered to suit local situations.

The board is beneficial for almost any patient spending much time in bed.

ADJUSTABLE FOOT BOARD

Side hinges up beside mattress and receives (through vertical slots) bolts on the "vertical footboard". Large wing-nuts, with flat bases, hold the footboard down firmly against the mattress.



←---one more like this:
They go under the mattress and
can move toward head or foot
depending on length of patient.

thickness of mattresses plus 15" or 16"

N.B. For ease of bed-making, wing-nuts can be removed from one (or two) sides and the side panels lowered.

Advantages of Vertical Footboard

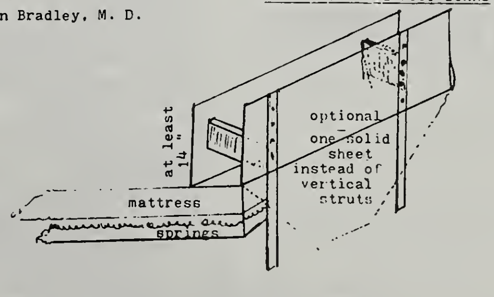
1) Avoids footdrop and shortening of calf muscles.
2) Maintains muscle tone and strength in legs.
3) Prevents venous stasis, and therefor pulmonary embolism.
4) Keeps bedclothes off of toes, thus preventing pressure necrosis.
5) Helps patient keep himself from sliding down in bed.

N.B. Protect patient's feet by wrapping footboard with bath blanket.

Prepared by:

E. Tremain Bradley, M. D.

NON-ADJUSTABLE FOOT BOARD



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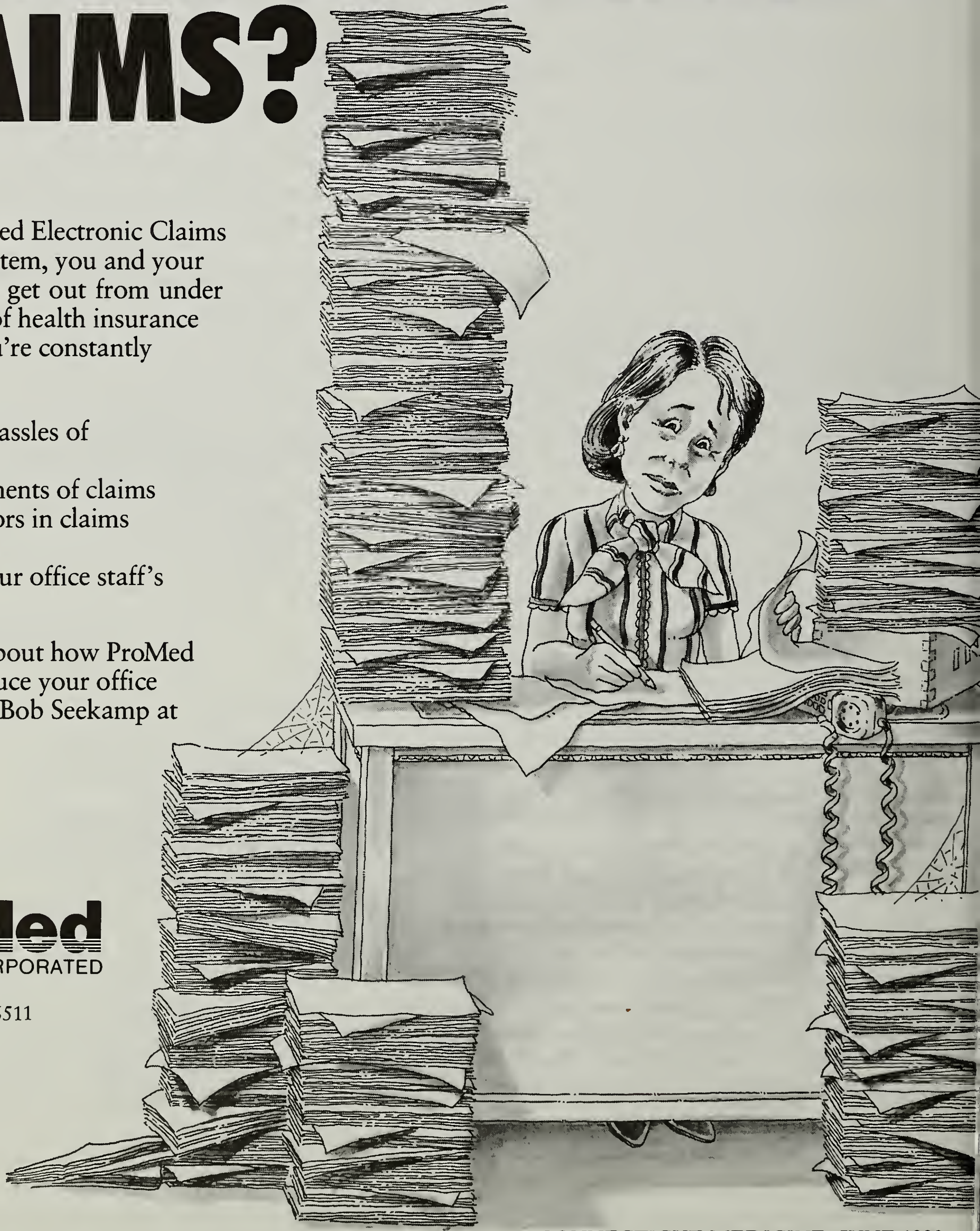

Editorial

Listeriosis

This month's issue of *Connecticut Medicine* contains a paper by Tosca et al[1] which gives the incidence of listeriosis in Connecticut during the last decade. Information is provided about the incidence of listeriosis based upon cases reported to the State Department of Health, and a plea is made for more careful reporting of cases as these occur in clinical practices within the state. The request for prompt reporting has poignancy in view of the recent increasing interest in the disease, particularly in association with food-borne outbreaks.

Although the organism of listeriosis, *Listeria monocytogenes* was first isolated from rabbits in a laboratory outbreak in 1926, and from human beings in 1929, it had occurred only sporadically since it was found in neonates in 1936. Then, in 1981, it turned up in association with an outbreak of disease among those who had consumed contaminated coleslaw. Since then it has been found in pasteurized milk in an epidemic outbreak in Massachusetts in 1983, and in Mexican-style cheese in Los Angeles, California, in 1985.[2]

In the Los Angeles outbreak 142 cases were found, 93 maternal or neonatal cases, and 49 nonpregnant. Among those who were not pregnant, 98% had compromised host factors such as carcinoma, steroid therapy, diabetes mellitus, or cirrhosis related to alcoholism. Three had AIDS. Only one individual had no known risk factors. There was a striking preponderance of cases among Hispanics, which was explained on the basis that Mexican-style cheese was commonly found in the Hispanic diet, where it was often eaten uncooked on an almost daily basis. It was felt that the soft cheese was an especially effective vehicle of transmission for the *Listeria* because it had been prepared with brine, with a high concentration of sodium, and because there would have been no inhibition of *Listeria* through the aging process which takes place in ordinary cheese (producing acid pH).

The Massachusetts outbreak which occurred in 1983 seemed to be associated with the consumption of whole or 2% fat milk. The production of skim milk seemed to reduce the risk of acquiring listeriosis. Although the pasteurization process was felt to be faultless, there was a filtration method that permitted leukocytes to pass through the system. It was felt that, because *Listeria* organisms tend to aggregate within leukocytes, a situation was created favoring bacterial survival of pasteurization. Following the pasteurization process, storage in the cold would have favored growth of surviving *Listeria* organisms. A 1981 outbreak involved coleslaw prepared from cabbage that was stored in the cold after it had been harvested from a field fertilized with *Listeria*-containing raw sheep manure.[3]

Listeriosis has also occurred in the hospital setting, sometimes as a nosocomial infection.[4] Evaluation of an outbreak involving patients from eight Boston hospitals led to the idea that *Listeria monocytogenes* is an enteric pathogen, and that antacid therapy or the use of cimetidine increased the risk for listeriosis. It was felt that person-to-person spread was not involved and that hospital food may have been the vehicle for transmission of *Listeria* organisms.[4]

It is well known that listeriosis is associated with underlying malignancies, pregnancy, and immunosuppressive therapy as well as immunodeficiency disease states. The lethal dose of *Listeria monocytogenes* in mice is drastically reduced with steroid treatment. T-cell immunity is also known to be extremely important in the defense against listeriosis. It has been suggested that listeriosis may be several hundred times more likely to occur in AIDS patients than in members of the population at large.[5]

Although listeriosis may occur in epidemics and occasional nosocomial clusters, cases typically occur sporadically. Between 1980 and 1982, there were 800 cases of listeriosis, with an annual incidence of 3.6 per million population. There were at least 150 deaths with a case fatality rate of 19%. Newborns had an attack rate of 47 per million per year. In 1986, there were estimated to be 1,700 cases of listeriosis with an overall incidence of 7.1 cases per million population. The attack rate was 124 per million live births, and 5.4 cases per million for cases not associated with pregnancy. In the 1986 survey, there were 21 cases per million among those 70 years of age or more, suggesting that the incidence of listeriosis increases with age. Whether food-borne transmission plays an important role in sporadic listeriosis is still unsettled, but seems quite likely. Surveys by the Food and Drug Administration and others have indicated that *Listeria monocytogenes* can contaminate 2% to 3% of processed dairy products tested and from 4% to 8% of samples of shrimp and cooked crabmeat. Surveys done in Europe and the United States have demonstrated that up to 30% of raw or ready to eat meat products, 15% to 20% of ground beef samples, and 15% - 18% of retail poultry products may be contaminated with *Listeria.*[5]

During pregnancy, listeriosis has been documented most commonly during the third trimester. The exact relationship with premature labor and spontaneous abortion has not been settled, but in one study from Europe the organism was recovered from placental and fetal cultures in 1.6% of pregnancies that resulted in premature labor and spontaneous abortion. Typically, pregnant women may experience a flu-like illness, sometimes associated with gastrointestinal symptoms, including abdominal cramps and diarrhea. In this setting, the infection is usually self-limited.

Perinatal listeriosis, on the other hand, has been associated with fatality rates ranging from 3% to 50% in live-born neonates. Two syndromes have been evident. One is an early onset of septicemia within hours or at least within a few days of life. Widely disseminated granulomas can be demonstrated in pathologic specimens. Late onset listeriosis usually affects full-term infants born to mothers with complicated pregnancies. Several days to several weeks after birth (14-23 days mean onset), a meningitis-like picture may develop. Occasionally the late onset variety has been associated with clusters in nurseries, implying nosocomial transmission.[5]

In cases of listeriosis unrelated to pregnancy, infection principally occurs among cancer patients, transplant recipients, elderly persons, and persons on immunosuppressant drugs. Increased susceptibility also is associated with chronic liver or renal disease, cardiovascular disease, iron overload from transfusions,[6] and diabetes mellitus. Thirty percent to 50% of the patients present with a meningitis syndrome, or with encephalitis or Central Nervous System abscesses. Other infections include endocarditis, primarily in individuals who have underlying cardiac lesions or prosthetic valves, and focal infections of the liver, gallbladder, joints, eye, lungs or pleura, and peritoneal spaces. Skin infections occasionally occur in veterinarians, poultry workers, and others handling infected animal products.

Optimal therapy for listeriosis remains controversial. Gentamicin may act synergistically with ampicillin, and a combination of ampicillin and gentamicin is the recommended treatment. In individuals allergic to penicillin a combination of sulfamethoxazole and trimethoprim is bactericidal and provides levels in serum and cerebrospinal fluid. Duration of treatment is generally recommended to be a two-week course in listeriosis complicating pregnancy, or neonatal listeriosis, two to three weeks in meningitis, and four to six weeks in endocarditis, or for listeriosis in compromised hosts.[5,7,8]

Recent attempts to evaluate the magnitude of the problem associated with listeriosis in the United States have led to the conclusion that listeriosis morbidity and mortality are grossly underestimated because of problems with reporting.[9] Listeriosis has been projected to cause approximately 1,000 infections yearly, with 150 deaths. This does not include infections and deaths related to stillbirths and abortions.

Clinicians should be aware that listeriosis is a diagnosis worth considering in adults with compromised host factors. As the AIDS epidemic continues to grow, it will be well for those following such patients to have a high index of suspicion for listeriosis. It is difficult at this point to outline effective control measures but individuals who are at risk, including AIDS patients, should probably be asked to refrain from ingesting food items associated with listeriosis, including improperly pasteurized dairy products and raw fruits and vegetables that have not been properly washed.[10]

It is of critical importance that clinical cases of listeriosis be reported promptly in order to gain further progress in the understanding of the mode of transmission of this disease. Since dairy products such as brie, ice milk mix, and ice cream bars may allow for extended periods of cold enrichment and multiplication of *Listeria monocytogenes,* these products may be responsible for cases that appear to be sporadic but are actually related to a common source. Investigation of *Listeria*-contaminated food products with sero-typing and phage-typing may lead to the recognition of common-source outbreaks. For studies such as these, very prompt case reporting to the State Health Department will be essential.

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Middletown

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MEHDI S. ESLAMI, M.D.

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Education:	Alborz College, Tehran, Iran, 1951. Tehran University Medical School, Tehran, Iran, 1957, M.D. Coney Island Hospital, Brooklyn, NY, 1958, Rotating Internship Hospital for Joint Diseases, New York City, 1958 - 60, Residency in radiology Memorial Hospital for Cancer and Allied Diseases, New York City, 1961, Residency in radiation therapy Long Island Jewish Hospital, New Hyde Park, NY 1962, Fellowship in Diagnostic Radiology
Certifications:	American Board of Radiology, 1964: Radiology: 1978: Nuclear radiology
Professional Societies:	Fellow of American College of Radiology Radiological Society of North America Radiological Society of Connecticut American Medical Association Connecticut State Medical Society New Haven County Medical Association Waterbury Medical Association President of New Haven County Medical Assocation, 1978 - 79 President of Waterbury Medical Association, 1975 Associate Councilor and Councilor, 1974 - 84 Chairman of Professional Liability Committee, CSMS Vice Chairman of Council, CSMS Vice Speaker of House of Delegate, CSMS Vice President of Connecticut State Medical Society, 1988 - 89 President Elect of Connecticut State Medical Society, 1989 - 90 Chairman of the Board Connecticut Medical Management, Inc., 1989 - 90 Member of the Board of Connecticut Medical Insurance Co., 1984 - 90
Hospital Staff:	Waterbury Hospital St. Mary's Hospital Senior Radiologist, Diagnostic Imaging Associates of Waterbury, Waterbury Medical Center

MEHDI S. ESLAMI, M.D.
President

The New President's Message

I thank you all for the honor and privilege of being your president for the next year. Filling Roger Beck's shoes is obviously no easy task for he has done an absolutely superb job in representing all of us. He certainly has assured himself a place among the Society's many fine leaders and statesmen in our almost 200 years of existence.

One thing I have learned in my many years of involvement in medical society affairs is that long speeches are not very popular. Therefore, with that in mind, my comments will be brief.

But I would be remiss if I did not commend this House of Delegates for its forward thinking, its daring posture to be bold and take a risk when necessary, and for its willingness to take decisive action. We have no shrinking violets in this House, but when it comes time to unite and take action, I don't believe that there is a state medical society anywhere and of any size that has met the challenges as firmly and squarely as has the Connecticut State Medical Society.

Yes, we encourage freedom of expression, and we have many debates in this House of Delegates and in the Council, but we have also managed to put our disagreements aside for the greater good when it came time for a decision. When we formed CPRO - when we implemented CMIC - when we established MD Health Plan and when we acted swiftly to expand statewide voluntary Medicare Courtesy Card Program which helped avert mandatory assignment in this state.

As you know, CSMS has also been engaged in other fronts as well - in the courts and legislative halls to preserve physicians rights against the growing tide of governmental and regulatory incursions. Our actions have always been consistent with what is in the public interest.

We are a strong and viable entity and I ask you for your continued support to help CSMS continue on that straight but increasingly difficult road. Thank you again for the opportunity to serve you as CSMS President. I assure you all that I will do my very best.

Mehdi S. Eslami, M.D.,
President

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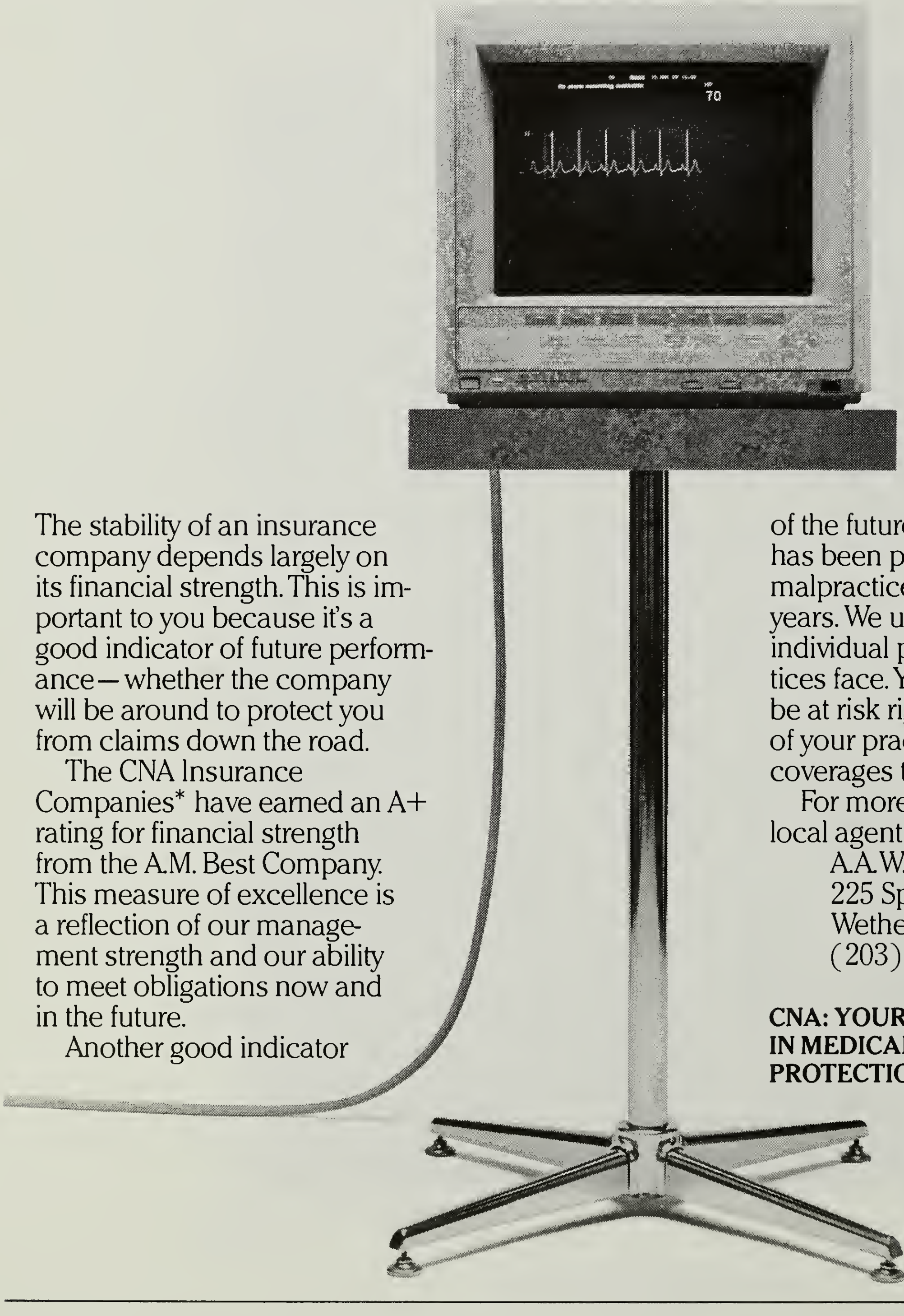

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Learning, Sagacity, Humanity, and Probity

ROBERT U. MASSEY, M.D.

In the short introduction to his "Bedside Library for Medical Students" William Osler urged them to "...rest not satisfied with this professional training, but try to get the education, if not of the scholar, at least of a gentleman." In another place, an epigraph to "The Master-Word in Medicine," he quoted from Benjamin Jowett's *Introduction to Plato:*

> If any one is desirous of carrying out in detail the Platonic education.... [he] may select for inquiry some point of history, or some unexplained phenomenon of nature. An hour a day passed in such scientific or literary pursuits will furnish as many facts as the memory can retain, and will give him "a pleasure not to be repented of " (*Timaeus,* 59 D).

Recently the students at a prestigious medical school in the South were asked to test their "...familiarity with basic concepts, names, and terms used in fundamental areas of cultural literacy." The test comprised some 250 items generally representing most areas of knowledge from the arts, mythology, the Bible, and literature, through politics, history, and geography, to the life sciences, medicine and health, and technology., There were no out-of-the-ordinary terms or names in these lists; after a quick glance you might say, "I'd miss a half dozen or so, probably not more."

On average the medical students identified about 28% correctly; the same test was given to law and MBA students: their scores were slightly lower. One student thought Aquinas was a Roman god, another that 1066 was an income-tax form. These were graduate students from good liberal arts colleges, most near the top of their class. They had not been asked to discuss Shakespeare's *Henry V*, only to know that the author was a 17th- (or 16th-) century English playwright.

Some of the medical students objected to words like "dropsy" and "childbed fever," saying that they should not be expected to recognize such old-fashioned terms. Perhaps it does not matter if most of the up-and-coming leaders in our society do not know about Lot's wife, or have never heard of Agamemnon, or cannot quite remember what happened at Appomattox Court House or My Lai, and do not know the difference between balkanization and brinkmanship. But somehow an almost total collective amnesia even for the recent past evokes worries of a coming age of universal dementia and a world.

> Swept with confused alarms of struggle and flight,
> Where ignorant armies clash by night.

In an essay that is often mentioned in a tone suggesting that he could not have been serious, Lewis Thomas urged the return of classical Greek to the college curriculum," ...universal within the curricula..., which could be used for evaluating the free range of a student's mind, his tenacity and resolve, his innate capacity for the understanding of human beings and his affection for the human condition."[1]

Dr. Thomas's essay was published 12 years ago. Six years later, the Association of American Medical Colleges in its GPEP Report (Physicians for the Twenty-First Century) noted that informed participation in society "requires understanding of its politics, history, and economics. To appreciate the many dimensions of human experience requires informed reflection upon the literature, the philosophy, and the arts that are included in the cultural heritage of all people...."

Medical educators are starting to pay attention to these matters, but the task seems overwhelming, for the liberal arts schools are caught between a secondary education that is often mediocre at best and a professional education considered to be the only one that counts. Anyway, these "cultural literacy" lists, aren't they just memorization exercises? We need men and women who can think. But who can think without facts? Isn't that just groping on "a darkling plain?"

ROBERT U. MASSEY, M.D., Professor, Division of Humanistic Studies in Medicine, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington.

REFERENCES

1. Thomas L: Notes of a Biology Watcher. How to fix the premedical curriculum. *N Engl J Med* 1978;298:1180-1.

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SINUS TACHYCARDIA AT THE BUZZER

To the Editor: By chance the EEG and ECG of a 42 year old woman were being recorded by an ambulatory cassette during the UConn - Clemson basketball game during the recent NCAA tournament. A normal EEG was recorded throughout the game. Her resting heart rate was approximately 60 beats per minutes (bpm). During the basketball game she had intermittent sinus tachycardia with rates up to 146 bpm. As Tate George's jump shot won the game at the buzzer, she had a sinus tachycardia with an interbeat rate of 162 bpm. Later she described herself as "very excited." An analogy can be drawn to the sinus tachycardia with rates from 160 to 180 bpm, with increases of as much as 100 bpm in as little as one minute, which have been recorded during human sexual intercourse.[1]

James O. Donaldson, M.D.

Farmington

1. Bartlett RG: Physiologic responses during coitus. *J Appl Physiol* 1956;9:469-72.

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The Jehovah's Witness Parent's Right to Refuse Treatment

JOSEPH M. HEALEY

The *Nicoleau* case,[1] described in last month's column,[2] involved an adult Jehovah's Witness who refused to consent to blood transfusions for herself before the delivery of her child and who persisted in her refusal following the birth of the child, despite losing a substantial amount of her blood. This was not a case involving parental refusal of necessary treatment for a minor child, nor a case involving an incompetent patient whose wishes were unclear or unknown. Rather, this case presented three major questions: (1) whether the failure to provide notice of the hospital's request for a court order permitting treatment over the objections of the patient and to provide a hearing at which the patient's interest could be represented violated the rights of the patient; (2) whether a patient's right to refuse treatment should be limited to cases in which the patient has a terminal or degenerative disease; and (3) whether the patient's status as parent justified overriding her right to refuse treatment. In his lead opinion, Chief Judge Wachtler used the answers to these questions as the basis for his and the Court's conclusion that the mother's right to refuse treatment had been violated.

The Chief Judge noted initially that since applications for court-ordered treatment affected important rights of patients, the due process requirements of notice and the right to be heard should be satisfied. While noting that there are circumstances when the patient is unable to express her/his wishes and the physician is justified in assuming that the patient, if so able, would choose treatment rather than nontreatment, the Chief Judge emphasized that such an exception is inapplicable in this case since the patient's opposition to treatment had been clearly and consistently expressed. The actions of the hospital and the lower court violated the due process of rights of Ms. Nicoleau.

In answering questions (2) and (3), the Chief Judge concluded that the patient had a common law and statutory right to refuse the transfusions. Although such a right is not absolute, and may be outweighed by compelling state interests in some cases, he concluded that none outweighed the patient's right to refuse treatment in this case. Examples cited of such interests included the state's right to compel vaccination, to mandate essential medical care for those incapable of deciding for themselves, and the state's interest in prohibiting treatment posing substantial risk to a patient. He rejected the claim that the right to refuse treatment should be confined to patients with terminal or degenerative diseases. He emphasized that inquiries about the patient's health status in prior cases were used to determine whether the conditions established by a now incompetent patient's previously expressed wishes about when treatment should be withheld or withdrawn had been satisfied. These cases did not require that a patient be terminally ill or suffering from a degenerative disease. Chief Judge Wachtler also rejected the claim that the state's interest in preserving the family unit or assuring that the child is not left parentless has not been viewed as an interest which the state enforces at the expense of all other personal rights or conflicting interests. Among other examples, he pointed out that the state does not prohibit parents from engaging in dangerous activities because there is a danger that their children might be left as orphans. Chief Judge Wachtler concluded that the competent adult patient had a right to refuse treatment, that there was no sufficient evidence of a compelling state interest to outweight such a right because of the patient's medical condition or parental status, and that the rights of the patient had been violated.

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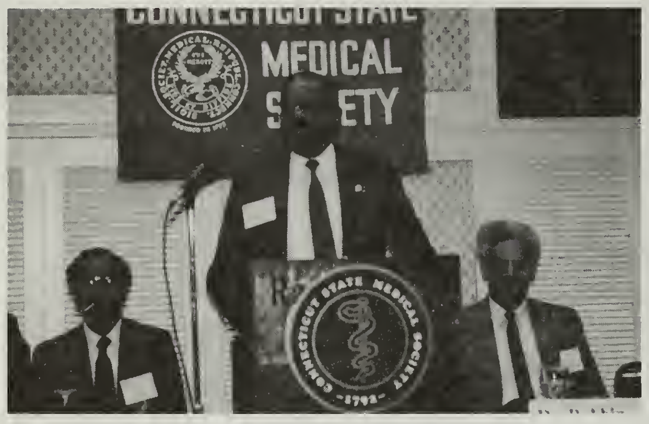
1. Healey JM: Treating a Jehovah's Witness Adult: Beneficience or Respect for Autonomy? *Conn Med* 1990;54:293.
2. *In the Matter of Fosmire v. Nicoleau*. State of New York Court of Appeals, No. 267, January 18, 1990 (Wachtler, Ch. J.).

JOSEPH M. HEALEY, J.D., Associate Professor, Department of Community Medicine and Health Care, University of Connecticut School of Medicine, Farmington.

1990 CSMS ANNUAL MEETING HIGHLIGHTS



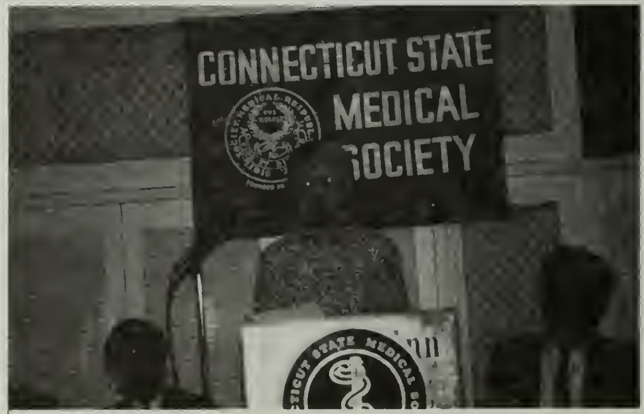
Frederick G. Adams, D.D.S., M.P.H., Commissioner, Connecticut State Department of Health Services addresses the House of Delegates with respect to the priorities of health services in Connecticut.

Newly inaugurated CSMS President, Mehdi S. Eslami, M.D., center, finishes his speech as Speaker of the House of Delegates, Kenneth M. Robbins, M.D., Middletown, right, and Vice-Speaker, Sultan Ahamed, M.D., Norwich applaud.

From left to right, President-elect, Anthony P. Redmond, M.D., President, Mehdi S. Eslami, M.D., Immediate Past President, Roger S. Beck, M.D., and Vice-President, Sultan Ahamed, M.D. listen to comments from the House of Delegates.

At a reception in his honor, Mehdi S. Eslami, M.D., 153rd President of CSMS, is congratulated by his daughter, Michele.

Outgoing CSMS President Roger S. Beck, M.D., presents donations of AMM-ERF to James D. Kenney, M.D., left, of Yale University School of Medicine, and Carl F. Hinz, Jr., M.D., right, of the University of Connecticut School of Medicine.



Mrs. Joan Reed, President of the CSMS Auxiliary, gives her report to the House of Delegates.

From the Executive Director's Office

SUMMARY OF PROCEEDINGS
CSMS HOUSE OF DELEGATES — ANNUAL MEETING
Ramada Inn, Meriden — May 9, 1990

Reports and Addresses

The House received reports, addresses and/or remarks from the President, Secretary, Treasurer, the Chairman of the Council, Delegates to the AMA, Chairman of the Board of Directors of COMPAC, the CSMS Executive Director, M.D. Health Plan, Connecticut Medical Management, Inc. (CMMI), Standing Committees, Representatives and Advisors, and Delegates from Massachusetts, New Hampshire, and Vermont. All of the reports were published in the Handbook that was distributed to the delegates, with a few exceptions. (The address of the retiring President, Roger S. Beck, M.D., appears at the end of this summary.) The inaugural address of the new President, Mehdi S. Eslami, M.D., appears as the President's Page elsewhere in this issue of *Connecticut Medicine*.

Frederick G. Adams, D.D.S., M.P.H., Commissioner of the Connecticut State Department of Health Services, was the guest speaker and presented an overview of the problems of access to medical care encountered by the working poor and uninsured segments of our population and the impact of AIDS on Connecticut citizens.

Election of Officers and Others

The House voted to approve the published report of the Nominating Committee (the Council) with minor amendments. Officers elected were:

President: Mehdi S. Eslami, M.D., Waterbury
President-Elect: Anthony P. Redmond, M.D., Greenwich
Vice-President: Sultan Ahamed, M.D., Norwich
Secretary: Marjorie G. Petro, M.D., Willimantic
Treasurer: Robert R. McDonnell, M.D., New Haven
Speaker of the House of Delegates: Kenneth M. Robbins, Middletown
Vice-Speaker of the House of Delegates: Michael M. Deren, M.D., New London
Councilor-at-Large: Roger S. Beck, M.D., Wethersfield

Delegates and Alternates to the American Medical Association:

Edward A. Kamens, M.D, Fairfield (D) 1/1/90-12/31/91
Joseph C. Czarsty, M.D., Oakville (A) 1/1/90-12/31/91
Jerome Bobruff, M.D., New London (D) 1/1/90-12/31/91
Annmarie S. Welch, M.D., New Britain (A) 1/1/90-12/31/91
Jerome K. Freedman, M.D., New Haven (D) 1/1/91-12/31/92
Neil H. Brooks, M.D., Rockville (A) 1/1/91-12/31/92
Joseph S. Sadowski, M.D., Hartford (D) 1/1/91-12/31/92
James P. Orphanos, M.D., Greenwich (A) 1/1/91-12/31/92
Stewart J. Petrie, M.D., Derby (D) 1/1/91-12/31/92
John B. Franklin, M.D., Hartford (A) 1/1/91-12/31/92

In approving the report of the Nominating Committee, it was also voted to increase the membership of the Committee on Geriatrics to 12 and to disband the Committee on Hospitals. It was also voted to approve the recommendation of the Council that authorization for the Section on Forensic Medicine be withdrawn, due to lack of interest expressed by the Section Officers.

Bylaw Amendment

The Council introduced the following Bylaw Amendment concerning dues delinquency. The amendment, in accordance with the Bylaws was placed on the table without discussion and shall lie on the table until the next regular meeting of the House at which meeting the amendment shall be taken off the table and acted upon by the House of Delegates

Subject: Delinquency
Purpose: To Remove Penalty for Delinquency

The Council recommends the following changes:

Article XII, Dues, Section 4, Delinquency

(Deletion in brackets and capitals)

Par. 1.—An Active Member is delinquent if his dues are not paid by April 30th of the year for which dues are prescribed and shall forfeit his Active Membership in The Society if he fails to pay the delinquent dues within the thirty days after notice of his delinquency has been mailed to his last known address by the Executive Director of the Society. (ACTIVE MEMBERS OF THE SOCIETY WHO HAVE BEEN DROPPED FROM THE ACTIVE MEMBERSHIP ROLL FOR NON-PAYMENT OF DUES CANNOT BE REINSTATED UNTIL SUCH INDEBTEDNESS HAS BEEN DISCHARGED, BUT SUCH INDEBTEDNESS SHALL APPLY ONLY TO THE ONE FISCAL YEAR OF DELINQUENCY.)

Awards

American Medical Education an Research Foundation

Dr. Roger S. Beck and Mrs. Joseph Czarsty, Chairperson, AMA-Education and Research Foundation for the Auxiliary, presented the following awards:

Yale University School of Medicine	$4,412.25
University of Connecticut School of Medicine	$2339.25

Yale University School of Medicine $4,412.25

James D. Kenney, M.D., Associate Dean for Graduate and Continuing Education, accepted the check.

University of Connecticut School of Medicine $2339.25

Carl F. Hinz, Jr., M.D., Associate Dean for Academic Affairs, accepted the check.

Connecticut Science Fair Awards

Dr. Beck presented the following awards:

First Place—Senior Division—Miss Margaret Stanek, Mary Immaculate Academy, New Britain

Project: "Beta Carotene vs Cancer: Fight of the Future"

First Place—Junior Division—(Joint Winners) Mr. Brett W. Matthews and Mr. Joseph J. Kudrak, St. Mary's and St. Michael's School, Derby

Project: "The Effect of Smoking vs Involuntary Smoking"

CSMS Charitable Trust

The first annual donation of its newly established "CSMS Charitable Trust" was awarded to the Connecticut Food Bank, a source of nourishment to some 45,000 low income households. A check for $15,000 was presented to the Connecticut Food Bank's Executive Director, Nancy Carrington, by fund trustee Roger S. Beck. M.D., as a gift from the members of the Connecticut State Medical Society. The Food Bank facilitates the statewide distribution of donated and purchased food to Connecticut's needy, some ten million pounds since its inception in 1982.

Dr. Roger S. Beck, outgoing CSMS president and chairman of the fund's Board of Trustees, reported that the Society's physician leaders organized the CSMS Charitable Trust recognizing that various social problems relating to poverty impact adversely on the health of many patients.

Mehdi S. Eslami, M.D., newly inaugurated CSMS president, thanked the delegates from the eight county medical associations for their members' initial response to the new CSMS Charitable Trust Fund. He stated that most physicians already provide some uncompensated medical care to those in need, but this fund is meant to address non-medical problems that cause much poor health in the first place. Poverty, crime, ignorance, and neglect are not topics to be found in any medical textbook, but the physical harm they cause fills the emergency rooms and morgues.

Address of the President

Annual Meeting — House of Delegates

May 9, 1990

ROGER S. BECK, M.D.

The activities of the Society and work of the many committees have been recorded for you in the Handbook and by the previous speakers, and I will not review them. Many of you seated here have helped to make this a most productive year for the Society. Together we have improved the image of physicians in the state. Together we have been able to find the common ground around issues where there were strong specialty society interests. Together we have presented a stronger almost united message to our peers, to the public, and to the legislators and other government officials at the State Capitol. A number of you testified at legislative hearings — a burdensome task at best, but so important if we are to influence the legislation which now dominates so much of what we physicians do. Others served on task forces with various government agencies — Dr. Joseph Zeppieri with the Workers' Compensation Commission and CBIA, Dr. Neil Brooks with nurses and health department people developing rules and regulations for nurse practitioners writing prescriptions, Dr. Stephen O'Brien with the Department of Health Services to license physician's assistants, and Dr. Dennis O'Neil with the group defining office laboratory requirements — to mention just a few of you.

As your president I visited at least one meeting of each county association. Believe me, the profession is alive and well in all parts of the state. There is strong leadership at the county level. Younger physicians, men and women, are actively involved at every meeting. They are the future of the Society. Their enthusiasm and dedication guarantee the continued success of our organization.

As president one is helped by many people. No help is more important than that given unstintingly by the staff—Tim Norbeck, Jo Lindquist, Kyle Ballou, Bob Brunell, and all the others—they have my most sincere appreciation. The job could not be done without them.

Once again, thank you for the great honor of having served as your president.

IN MEMORIAM

CORCORAN, MICHAEL A., Tufts, 1929. Dr. Corcoran was a general practitioner in the Hartford County area since 1932. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 27 March 1990 at the age of 86.

DOLBERG, HAROLD M., Leiden University, 1958. Dr. Dolberg was an emergency medicine physician in the Fairfield County area since 1961. He was a member of the Fairfield County Medical Association and the Connecticut State Medical Society; died 24 April 1990 at the age of 63.

GIBSON, FORREST D., Syracuse, 1935. Dr. Gibson was a gynecologist in the Hartford County area since 1940. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 30 March 1990 at the age of 80.

HENKLE, ROBERT T., Cornell University, 1931. Dr. Henkle was a radiologist in the New London area since 1959. He was a member of the New London County Medical Association and the Connecticut State Medical Society; died 20 April 1990 at the age of 84.

LAPENTA, ROCCO G., George Washington University, 1937. Dr. LaPenta was a general practitioner in the Hartford County area since 1940. He was a member of the Hartford County Medical Association and the Connecticut State Medical Society; died 29 April 1990 at the age of 82.

MCCUE, MARTIN P., Harvard, 1934. Dr. McCue was an internist in the Hartford County area since 1935. He was a member of the Hartford County Medical Association and the Connecticut State Medical Society; died 21 April 1990 at the age of 81.

MCFARLAND, WARD J., Yale, 1939. Dr. McFarland was an orthopedic surgeon in the New London County area since 1946. He was a member of the New London County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 9 April 1990 at the age of 75.

MURRAY, JOHN G., New York University, 1943. Dr. Murray was an internist in the Fairfield County area since 1947. He was a member of the Fairfield County Medical Association and the Connecticut State Medical Society; died 24 March 1990 at the age of 70.

NEWMAN, RICHARD, Johns Hopkins, 1930. Dr. Newman wa a psychiatrist in the New Haven County area since 1932. He was a member of the New Haven County Medical Association and the Connecticut State Medical Society; died 12 March 1990 at the age of 85.

ORBACH, EGMONT J., University of Berlin, Germany, 1924. Dr. Orbach was a vascular surgeon in the Hartford County area since 1937. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 22 May 1990 at the age of 90.

RILANCE, ARNOLD B., McGIll, 1931. Dr. Rilance was an internist in the New Haven County area since 1938. He was a member of the New Haven County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 13 May 1990 at the age of 82.

ROOT, MAURICE T., Cornell, 1918. Dr. Root was a general practitioner in the Hartford County area since 1922. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 23 April 1990 at the age of 97.

SICA, VINCENT F., Catholic University, Louvain, 1957. Dr. Sica was a general practitioner in the Fairfield County area since 1958. He was a member of the Fairfield County Medical Association and the Connecticut State Medical Society; died 28 March 1990 at the age of 61.

STEWART, LESTER Q., Yale, 1933. Dr. Steward was a general practitioner and surgeon in the Hartford County area since 1935. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association; died 10 March 1990 at the age of 87.

WILLIS, THAYER, Yale, 1936. Dr. Willis was a pediatrician in the Fairfield County area since 1937. He was a member of the Fairfield County Medical Association and the Connecticut State Medical Society; died 28 March 1990 at the age of 81.

WILSON, WILLIAMS, R., Johns Hopkins, 1925. Dr. Wilson was a pediatrician in the New Haven County area since 1930. He was a member of the New Haven County Medical Association and the Connecticut State Medical Society; died 23 March 1990 at the age of 91.

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CSMS PHYSICIAN PLACEMENT SERVICE

The Society maintains the Physician Placement Service as a free service to the medical profession in Connecticut. Opportunities for physicians to locate in Connecticut will be published as space permits and will be distributed to physicians making inquiries of such opportunities. Information should be sent to 160 St. Ronan St., New Haven, CT 06511 (203-865-0587).

Physicians wishing to establish practice in Connecticut are invited to submit a resume to be kept on file with the Society. An announcement of a physician's availability will be published in two issues of *Connecticut Medicine* as space permits.

Listing of physicians in the Placement Service does not in any way represent certification by the Society. Investigation of credentials and experience is the responsibility of those seeking applicants for positions.

OPPORTUNITIES FOR PRACTICE

ALLERGY

Active Allergy Practice in large, centrally located Connecticut city with large metropolitan population is available for sale. Also a small office building suitable for one or two doctors available on a sell or rent basis, within easy walking block to hospital or short drive to medical school. Write to: John F. Beakey, M.D., 25 Robeth La., Wethersfield, CT 06109.

AMBULATORY CARE

Physician needed full time for an ambulatory care center in the Greater Bridgeport Area. Broad general medical, orthopedic, and minor surgery skills required. F.P., E.M., and general IM preferred. Salary and benefits commensurate with experience. Please send CV to Dominick V. Sorge, M.D., 4490 Main St., Bridgeport, CT 06606.

INTERNAL MEDICINE

Pulmonary Medicine. Board Certified/Board Eligible pulmonary internist sought for pulmonary/critical care practice in the Hartford, CT area. Seeking associate leading to early partnership for office based practice, with active involvement in community hospital intensive care units, respiratory therapy departments and PFT labs. At present practice is entirely oriented to pulmonary disease/critical care; there is ample opportunity to remain skilled in all pulmonary critical care procedures. Practitioners interested in a traditional private practice in an attractive area of New England, will be most attracted to this position. Position available at present; will consider candidates available for July 1991. Send CV and reply to: Northeastern Pulmonary Associates, 43 Main St., Rockville, CT 06066.

Internist/Primary Care—Excellent and unusual opportunity for BC/BE Internist or FP to attain early partnership in very busy Hartford area. Solo, private practice, associated with Hartford Hospital. Practice consists of suburban and urban offices. Very enjoyable patient load. No welfare or nursing home patients. No financial investment. P.O. Box 14344, Hartford, CT 06114.

Internist BC/BE wanted to join private Pharmaceutical research corporation. Excellent part time opportunity for combining primary care experience with medical research responsibilities. Send CV to : Medical Director, N.M.R.C., 25 Main St., Hartford, CT 06106.

Physician for group IM Practice/Walk-in Treatment Center in Farmington Valley, CT. Experienced. Board certified in IM; FP; or EM. Competitive salary and benefits. Full Time. Send CV to: Box 555, Canton, CT 06019.

Locum Tenens wanted for active internal medicine practice in beautiful Northwestern Connecticut. Three to 12 months assignment beginning 1990-91. Salary plus assistance in living accommodations. Write: P.O. Box 1168, Sharon, CT 06069.

MISCELLANEOUS

To share fully-equipped medical office in Fair Haven area. Low rent. Write, CSMS, c/o MSC/LM.

PART TIME

Part time Medical and/or Psychiatric Consultants; various hours and locations statewide. Please contact John Galiette, Acting Chief, Bureau of Organizational Support, 10 Griffin Rd., North, Windsor, CT 06095. Telephone: 298-2032.

The Pomfret/Dayville area office of the Division of Rehabilitation Services is in need of a physician to serve as a part time Medical Consultant, three to four hours a month. The current rate of reimbursement is $45.00 per hour. Specifically, a District Medical Consultant is responsible for interpreting medical data and reports, recommending medical/psychiatric treatment services and monitoring client progress reports, identifying functional limitations, advising on the adequacy of medical information, clarifying the need for further diagnostic services, developing community medical resources, and acting as liaison with the medical community within the districts. Interested individuals may contact Robert Igo, Director of the Division's Norwich District Office at 887-3546.

PEDIATRICS

Pediatrician—Nonprofit, ambulatory, community health center seeks a pediatrician with a commitment to serving underprivileged communities. Applicants must be board eligible or board certified. Send resume to: Personnel Department, Charter Oak Terrace/Rice Heights Health Center, 81 Overlook Terrace, Hartford, CT 06106. EOE.

Opportunity immediatcly available for BC/BE pediatrician who desires to participate in established, quality care pediatric practice. Practice presently has two physicians and now seeks a third. Salary leading to possible partnership. Contact Jane Rudolph, M.D., 179 Roseland Ave., Waterbury, CT 06710. (203) 574-4747.

PRIMARY CARE

Medical Director—nonprofit, ambulatory, community health center seeks an experienced primary care physician with a commitment to serving underprivileged communities. Family practice and internal medicine specialists are preferred. Applicants must be board eligible or board certified, and possess strong management and organizational skills. Send resume to: Personnel Department, Charter Oak Terrace/ Rice Heights Health Center, 81 Overlook Terrace, Hartford, CT 06106. EOE.

Occupational Health. Active occupational health center has a half-time position available immediately for a physician who is BE/BC in primary care medicine. Hours are Monday through Friday, 1:00 P.M. to 5:00 P.M., at two different sites. Very likely to be full time in future. Please contact: Allen M. Ford, M.D., 140 Grandview Ave., Waterbury, CT 06708. (203) 573-8114.

PRIMARY CARE/INTERNAL MEDICINE

Internist needed for busy, four man, primary care internal medicine office. Suburban Hartford. Member wishes retirement. Terms negotiable. Send replies to: CSMS, c/o PC/HJ.

RADIOLOGY

Full time or permanent part time position with growing practice in eastern Connecticut. Position available now and includes coverage in two hospitals and two private imaging offices. Competitive salary and fringe benefits. Three radiologists in practice. Shoreline area is a great place to live. Send CV to: John Foster, M.D., 21 Montauk Ave., New London, CT 06320.

Board certified or board eligible radiologist to join a hospital and multi-office group practice in North Central Connecticut. Applicant should be competent in all imaging modalities including CT and MRI. Training in interventional radiology is desirable but not essential. Salary first year leading to full partnership. J. Danigelis, M.D., 151 Berle Rd., South Windsor, CT 06074.

Radiologist wanted for general radiology, ultrasound and mammography in private office practice in Waterbury area. Full time associate preferred but will consider part time. All replies confidential. Reply to CSMS, c/o RAD/DF.

PHYSICIANS WISHING TO PRACTICE IN THE STATE OF CONNECTICUT

FAMILY PRACTICE

Sept. '90. Age 33. Licensed in Connecticut. Presently in practice. Na bds. AB cert. MD, Harvard Medical School, Boston; Res., Universi Hospitals, Cleveland. Prefers primary care, urgent care, adolescent university health care type practice. Write, Barry Knishkowy, M.D Sasqua Pond Rd., E. Norwalk, CT 06855.

INTERNAL MEDICINE

July '91. Age 32. Nat'l bds. AB cert. MD, Autonomus University o Guadalajara, Guadalajara, Jalisco; Int., Res., and Fellowship, College o Medicine & Dentistry of New Jersey—New Jersey Medical School Newark. Prefers group or associate type practice. Write, Joseph L Ianello, M.D., 72 Newark Ave., Apt. #5, Belleville, NJ 07109.

March '90. Age 36. Nat'l bds. AB cert. MD, Albert Einstein College Bronx, NY; Int. and Res., Morristown Memorial Hospital, Morristown NJ. Prefers any type of practice especially group and ambulatory care Write, Mark Tieman, M.D., 6 Gilbert Lane, Plainview, NY 11803.

Gartroenterology. Available July 1991. Age 34. Presently in practice. Nat'l bds. AB cert. MD, George Washington University, Washington, DC; Int. and Res., Walter Reed Army Medical Center, Washington, DC; Fellowship, Brooke Army Medical Center, San Antonio, TX. Prefers group or associate type practice in a medium-sized community. Write, Richard I. Andorsky, M.D., 5824 Weatherford Rd., Fayetteville, NC 28303.

RADIOLOGY

May '90. Age 44. Nat'l bds. AB cert. MD, New York Medical College, New York, NY; Int., Lenox Hill Hospital, New York, NY; Res., NY Medical College, New York, NY; Fellowship, Metropolitan Hospital Center, New York, NY. Prefers group or institutional type practice. Write, William Cristo, Jr., M.D., 12 Delafield Dr., Lenox, MA 01240.

PAID CLASSIFIED ADVERTISING

All paid classified advertising orders, correspondence and payments should be directed to: CONNECTICUT MEDICINE, Classified Department, 160 St. Ronan St., New Haven, CT 06511, Tel. (203) 865-0587. The classified rates are as follows: $60.00 for 25 words or less; plus $1.00 for each additional word. For confidential answers, the cost is $3.00 per insertion, sent in care of CONNECTICUT MEDICINE. Ad copy, with payment, must be received no later than the first day of the month preceding month of issue.

NEW MEDICAL BUILDING—Old Saybrook. Buy or rent at preconstruction prices in fast growing Old Saybrook. Superb location—occupancy May 1991. Full written details from Geoffrey Wilcock—(203) 632-2014.

TOP OF THE LINE Cambridge CS 6 EKG machine, triple lead, adaptable for cardiac stress testing. Asking $4,500.00 or best offer. COMPOS HOLTER Monitor with Epson Printer. $4,000.00 negotiable. Call after 3:00 P.M. (203) 374-2325.

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